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**AN ACCOUNT OF THE DISTRICTS OF
BIHAR AND PATNA
IN
1811-1812**

**BY
FRANCIS BUCHANAN**

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VOLUME II

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**BOOKS III—V
APPENDICES AND
MAPS**

BOOK III

OF THE NATURAL PRODUCTIONS OF THE CITY OF PATNA
AND OF THE BEHAR DISTRICT

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BOOK III

OF THE NATURAL PRODUCTIONS OF THE CITY OF PATNA
AND OF THE BEHAR DISTRICT

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CHAPTER I

OF THE ANIMALS

Monkeys are by no means troublesome. In the hills of Newada and Sheykhpurah are said to be a few of the long tailed kind, which in Bengal are called Hanuman, but which here are known by the name of Langgur; and in the wilder parts of Sahebgunj I heard of a few of the short tailed kind called Markat; but, although I was much both among the woods and hills, I saw neither one nor other. I have however no doubt that in the Rajagriha hills I heard the cry of the Langgur.

The Indian black bear (Bhal) is the most destructive wild quadruped of considerable size, and shelters itself in the bare rocky hills scattered through the district of Behar. The principal injury that it commits, is by eating sugar-cane and mangoes, and by drinking the palm wine; for it climbs trees with great facility. When surprised, however, or irritated, he occasionally has destroyed men, and frequently wounds them. The chief native officer of police in the division of Nawada says, that having killed a large one, he found it to weigh five mans of the weight usual in that vicinity, or about 295 lbs. avoirdupois. The badger, which Shaw calls *Ursus Indicus*, is found in the same places with the black bear, and is called Bajarbhal. The account given here of its manners is similar to that given in Bhagalpur. The same officer of police, who weighed the bear, weighed one of these animals, which was considered a large one, and found it to be three mans or 177 lbs. The Indian Ichneumon is not near so common as could be wished, venomous serpents being exceedingly destructive. In old mango groves, especially about Sahebgunj, is a species of Ichneumon not described in any book that I possess, but common about Calcutta, where it is called Bham or Bhondar. Here it is called Musbilai, or the mouse cat, and it is alleged to be very

fond of palm wine; but its common food would appear to be birds and fish. Others are occasionally seen.

The royal tiger or Selawah is very seldom seen anywhere except in the wilds of Nawada, where they are said annually to kill from 2 to 4 people, and from 30 to 40 head of cattle; and they are so fierce, that even the buffalo cannot resist their attack. This ferocity seems to be owing to the want of game. In the rocky hills scattered through Behar the spotted tiger (Kengduya) is not uncommon, and occasionally destroys both men and cattle; but his chief prey seems to be the antelope.

I did not see the animal, nor from the description of the natives can I ascertain whether it is the Leopard or the *Felis jubata* of Schreber. The people of these districts seldom venture to attack either kind of tiger; but hunters in some years come and kill one or two. The Kohiya, or wild dog, visits also these districts, usually in spring; but I have not been able to procure a specimen. Jackals are not near so numerous as in Bhagalpur, nor even as in any part of Bengal that I have seen. I heard of a few wolves (*Hundar*), but have never been able to procure one. In Daudnagar it was said that they occasionally destroy children. The small Indian fox (*Canis bengalensis* Pennant) is not uncommon.

Except in Nawada, as before mentioned, accidents from beasts of prey are very uncommon, and wherever a man has been killed, he is supposed to become a very troublesome ghost, whose wrath it is necessary to appease by sacrifice.

There are very few porcupines; but in the drier parts of these districts hares are very numerous, and by the lower classes are a good deal sought after for eating. They are caught both by dogs and nets. The small striped squirrel (*Gilhari Rukhi*) is exceedingly numerous both in houses and plantations. It is a beautiful lively creature, very familiar and active and does little harm, although it eats all kinds of provisions, but in general it contents itself with wild fruits.

Rats and mice, although apparently not so

numerous as the squirrels, do vastly more harm, and are in fact the most destructive animals in these parts.

No wild elephants haunt these districts, but a very few make occasional incursions from the wilds of Ramgar. In Nawada these incursions were formerly frequent and destructive. It some years ago happened, that a Brahman had prepared from the poisonous root of Nepal, called here Dakra, a certain oil used as an external remedy in disease; when, the elephants coming, one of them accidentally eat of the oil, and died. On this some low people made balls of this oil, mixed with grain and other things, of which the elephant is fond, and having placed these balls in the way of the herd, 15 or 16 were killed; since which these cunning animals have given no farther trouble to that vicinity. There are no rhinoceroses. Wild hogs are occasionally seen, but they are nowhere numerous nor destructive, being eagerly pursued by the lower castes, who eat this flesh. The antelope cervicapra (Bareta) is the only animal included by the natives in the generic term Harin, that I saw, and it seems chiefly confined to the vicinity of the Rajagriha hills, nor even there is it common. There are several other animals which the natives refer to this genus: such as the Ghoraroj mentioned in my account of Bhagalpur; the Chitra, which is probably the *Cervus axis*; the Kod, which is probably the stag; and the Derk, which is probably the *Cervus muntiac*. All these animals are scarcely ever seen, except just towards the boundary of Ramgar. There are no wild buffaloes, nor are these districts ever visited by the wild animal of the ox kind, mentioned in the account of Bhagalpur. In fact, wherever industrious man appears, all these pernicious animals must give way, and nothing but a want of exertion can be assigned as the reason why many parts of Bengal are allowed to remain subject to their depredations. In these districts there are no professed hunters, but, as I have said, many of the lower castes are eager in the pursuit of game for their own pot: it is seldom sold.

In the Ganges porpoises are numerous, but no one pursues them, nor is their oil in request, although they are occasionally taken in the fishermen's nets. Birds of prey are numerous, but do little harm, nor are any fit for sport bred in these districts; 50 or 60 families keep trained hawks, this being the favourite amusement of the great, in which some even of the Gayawal priesthood indulge themselves. The profession of falconer (Mirshekar) being very low in the estimation of the Hindus, most of the men who keep the hawks have become Muhammedans. With a rod dipt in bird-lime they catch enough to support their hawks, and a few of them catch quails, partridges or teal for sale; and it is said that some of the two former are fattened for eating, but I have not seen such; nor during my residence at Patna have I seen any one wild bird at any gentleman's table, not even the Bageri lark, usually called Ortolan, although these are abundantly common, and very destructive to the crops that remain in spring. In the cold season a great variety of excellent waterfowl abound in the reservoirs and ponds of Behar, but they seem little sought after, so that with little or no trouble I procured a great abundance. Quails are often tamed for fighting. Singing birds and parakeets are not caught in these districts, but a great many are kept. The most destructive birds to the crops are several species of crane, (*Ardea Antigone*, *A. Grus* and *A. Virgo*), which abound in the cold season, and the Karakul (*Tantalus manillensis*), which remains all the year.

There is however, little necessity for watching the crops, either to keep off birds or quadrupeds. It is sugar-cane that suffers most, and chiefly from wild hogs, bears and jackals. Watchmen are therefore chiefly employed to keep off thieves and cattle.

In the Ganges, tortoises are very numerous, and are often caught by the fishermen, who eat them; but they are scarcely saleable, no other castes near the river caring for this kind of food. I have been able to make no observations on

their manners, and it is possible that many escaped my notice, as I saw only four kinds, the Abhuya, Singriphiya, Dhongrka, and Katahi. The first is a small animal not exceeding a foot in length which, in the Ronggopur district, is called Khagrakata. The 3rd is about the size of the first, and I have seen it no where else. The fourth is the same with the Gotajhol of some parts of Bengal, and grows to a large size.

Both kinds of crocodile are common in the Ganges, but are not pursued; nor are lizards in request with any, but some of the dregs of impurity. Serpents are fully as numerous and destructive as in Bhagalpur, and according to the report of the natives, probably from 300 to 350 persons are annually killed by the bites of these reptiles. Except on the banks of the Ganges, fish, during the greater part of the year, are scarce, and mostly of a very poor quality. In the Son, indeed, the fish is better than that of the Ganges, nor have I ever seen fresh-water fish of a quality superior to several kinds of the carp which are caught in that river; but, whether from the fish being there scarce, or from want of sufficient skill in the fishermen, the supply from the Son is trifling. In the rainy season, indeed, this river swells so enormously and rushes with such violence, that few fish, I believe, could by any means be caught; and in the dry season the water is in general so shallow and clear, that the simple and imperfect methods used by the native fishermen are quite inadequate. The other rivers of the interior are mere torrents; and, although a few fish ascend in the rainy season, and are caught when the water subsides, the supply that they give is trifling. In some places, however, the fishermen, after the rivers have greatly subsided, form dams that collect deep pools of water, into which all the remaining fish assemble, and are kept as a supply for spring. The reservoirs made for watering the fields during four or five months in the year, give a considerable quantity of fish, but all the kinds are small, seldom exceeding three or four inches in length. In August every rice field swarms with such, and

many of them, no doubt, make their way up the rivers, and from thence through the canals used in irrigation, and through the rills that fall from the fields; but, as I have before several times stated, these means seem to be inadequate to account for the number of fish that appears, and I have no doubt that the greater part is bred from eggs that remain dry in the soil, until hatched by the heat and moisture of the rainy season. As the fields dry, a great many of these fish become a prey to the lower class of farmers, who catch for their own use; but vast multitudes flock into the reservoirs, ditches being in general cut to give them a passage as the waters retire. The reservoirs are let by the owners to professional fishermen, who, as the water dries up, catch the fish with very little trouble, and the supply continues pretty copious until February. The only supply after that until September is procured from a few tanks, reservoirs and pools in rivers, mostly artificial as just now mentioned, that retain water throughout the year, but as such places are few in number, the supply is very scanty, and does not employ one eighth of the fishermen. In the Ganges the supply of fish is copious from the middle of October, until the rainy season has swollen the river about the end of June.

The fisheries in the pools and reaches of the interior, in the reservoirs and in ponds, are annexed to the lands by which they are surrounded, and are let for very trifling sums. The whole fisheries in the division of Sahebgunj, I was told, let for about 7000 R. a year, to about 800 fishermen; but this is a very large proportion of the whole of the fisheries of the Behar district, which I am told may let at for about 1600 R. a year. Some landlords, however, agree with people who undertake to keep the reservoirs in repair for the fish. In the district of Patna city, the fisheries may be let at between three and four thousand R. a year. The main stream of the Ganges is free to all but fishermen, for the land which their hut occupies always pays higher than any other class. Any fisherman may therefore use the great river; but if he erects

on the banks a shed however wretched, he must pay rent in the rate of which his gains as a fisherman are always considered. In creeks or channels of the river that in the dry season have no current, the fish are the property of the owner of the bank; but the number and extent of such in these districts is very trifling, and disputes about the property of the largest in the immediate vicinity of Patna, have put a total stop to its being used, it not being the duty of any person to interfere. The supply in Patna, however, from the middle of October to the middle of June, is copious, there being many fisheries on the north side of the Ganges.

Very few of the fishermen live the whole year by this profession. During the rainy season those near the Ganges act chiefly as boatmen, and fish about eight months. In the interior, during spring, some of them go to the forests to make catechu, and the remainder reap wheat and barley. In the early part of the rainy season they transplant and weed; they fish only therefore four or five months, and their operations are much interrupted by the rice harvest, in which during winter by far the greater part is employed. During the time that they are employed in fishing, it is supposed that, besides paying the rent of the fishery, which is high, each man, assisted by a woman to sell, can clear from three to five R. a month. Near the Ganges it is supposed that there are 530 houses of fishermen, in which there will be about 1200 able bodied men. These have not above 200 boats employed in fishing, exclusive of what are used as ferries. In the interior there are about 1100 houses, with more than double the number of able-bodied men. These have no boats, except such as are employed as ferries, and a very few in the Son. It must be observed that the number of people of fishing castes is much greater than what I have here stated; I only here include such as are actually fishermen.

With respect to the kinds of fish I have few remarks to offer, as no reasonable remuneration would induce the fishermen to bring me a com-

plete set of the various sorts. In the most favourable season of the year I hired two men for two months to attend the fishermen, and to purchase every kind that was caught, and the result of their labour is given below.

1. The Raja called Saukchi at Mungger (Bhagalpur No. 1) is known here by the same name and sometimes its body is three feet in diameter. A considerable quantity of oil separates from it in boiling, and is used as a medicine. Great numbers are caught when the river begins to fall.

2. The Phuliya-Phokcha of Patna is the species of *Tetrodon*, which in Puraniya (No. 1) is called simply Phokcha.

3. The Bara Phokcha of Patna is the Phokcha of Mungger (B. No.2).

4. The eel, which in the Puraniya list (No. 5) is called Susukakangchal, at Patna is called Dudhiya.

5. The Vam of Patna is called by the same name at Munkker (B. No. 4).

6. The Pathi of Patna is the *Macrogнатhe aguillonée* of La Cepede, and the same with the Pat of Mungger (B. No. 5). The names are evidently the same; I suppose the orthography here is the most correct.

7. The Bhungri is another species of the same genus, which is the same with the Gochi of Ronggopur (No. 5).

8. The Gobius called here Gulla is the Bulla of Mungger (B. No. 6), which shows that the orthography given there was erroneous, as both at Patna and Nathpur the word commences with G.

9. The large (Bara) Khesra of Patna is the species of *Trichopode* called Kholisha in Ronggopur (No. 7), and is called large, not on account of its size, but because it is considered as the prototype of a genus.

10. The Lalkotra is another *Trichopode*, which is called Lalkholisha in Ronggopur (No. 12). The name Lalkotra in Puraniya (No. 12) is given to a very distinct species (R. 8), although both in

their colour have a mixture of red, from whence the name is derived.

11. The Sauri of Patna is called by the same name at Mungger (No. 9), and is the *Ophiocephale Wrahe* of La Cepede.

12. The Chengga of Patna is another species of the same genus, and is every where known by the same name (P. N 15).

13. The Garai of Patna is another species of the same genus, and is known by the same name at Mungger (B. No. 8).

14. The Dhalo of Patna is known by the same name at Mungger (B. No. 11), and is a Holocentre.

15. The Kabai of Patna is the *Lutjangrimpeur* of La Cepede, often already mentioned (P. No. 20, D. 10 R 20).

16. The Bhola of Mungger (B. No. 13) is found also at Patna, where it is called by the same name.

17. The Chanda of Patna differs from that of Mungger, and is the small fish called Bakul in Ronggopur (No. 23).

18. The Sisra of Patna is the small Centropome called Bogura at Ronggopur (No. 25).

19. The small species of *Cobitis* called Angchatta at Patna is the same with the Ramtengra of Mungger (B. No. 18). The latter name was probably a mistake, as the fish has no sort of affinity to the others called Tengra.

20. The Vaghi is a *Cobitis*, which derives its name from being striped like a tiger, and is called by the same name in Puraniya (No. 27), and Mungger (B. No. 16).

21. The Latta of Patna is the same *Cobitis* with that which at Ronggopur is called Bute (No. 30).

22. The Mangri of Mungger (B. No. 20) is known at Patna by the same name.

23. The same is the case with the Singghi of Mungger (B. No. 21).

24. And with the Boyari (B. No. 22).

25. And with the Papta (B. No. 24).

26. And with the Tambuliya Papta (B. No. 23). The two last are plenty at Patna, and are most excellent fishes.

27. The *Pimelodes* called *Bachoya* at Mungger (B. No. 27), at Patna is called *Sugwabachoya*.

28. The *Pimelodes*, which at Patna is called *Patasi*, differs very much from the fish so called at Mungger, and is the *Doya* of Ronggopur (No. 55).

29. The *Ritha* of Mungger (No. 29) and Patna are the same.

30. The *Ar* of Patna, is the *Ari* of Ronggopur (No. 60).

31. The *Susna Palwa* of Patna is the *Pathari Tenggora* of Ronggopur (No. 49).

32. The *Chhota Tengra* of Patna is the *Tenggora* of Ronggopur (No. 43).

33. The *Belaundi* of Patna is the *Menada* of *Puraniya* (No. 54).

34. The *Kauyal* of Patna, mentioned by the same name in the account of Bhagalpur (No. 40), is a species of *Esox*.

35. To the same genus belongs the *Nakta Kauyal* of Patna, a small fish, that hitherto I have had no occasion to mention, nor is it described in *La Cepede*. It does not grow to so large a size as the *Kauyal*.

36. The *Angruyari* is the species of *Muge* called *Ghobol* in Dinajpur (No. 31), and is found in the Ganges, but is not common so high up as Patna.

37. The *Tharri* of Patna is a smaller species of *Muge*, which at Goyalpara is named *Khoskhosiya* (R. No. 69).

38. The *Myste*, which at Mungger was called *Kanchatti* (B. No. 42), is at Patna known by the name of *Kanbhuni*.

39. The *Moi* of Patna is the same with that of Mungger (B. No. 43).

40. The same is the case with the *Phasiya* (B. No. 44).

41. The same also is the case with the *Hilsa* (B. No. 45). At Patna this fish is much more plentiful than at Mungger; but this must be owing to greater pains bestowed on the fishery. They are very small and poor, but in the rainy season are the only large fish that can be usually procured.

42. The Clupanodon called Chapra at Mungger (B. No. 46), is at Patna known by the name of Khayra, a name given in various parts of Bengal to several other species of the same genus. These species are indeed so nearly allied, that the distinguishing them by different names in common discourse would be of little importance.

43. The small fish, that in former accounts I have referred with much doubt to the genus *Cyprinus*, and which at Mungger was called Pithari and Gorda (B. No. 49), at Patna is known by the latter name.

44. The small fish, which at Mungger was called Chapti (B. No. 50), at Patna was called Chipuya, which is probably the true orthography, the native writers being very careless in spelling; but at Mungger there is another fish called Chipuya.

45. The Malhi of Patna is the Mali of Mungger (B. No. 51), evidently the same name.

46. The Ghorchelha of Mungger (B. No. 53) is at Patna called Hangota.

47. The Chipuya of Mungger (B. No. 55) at Patna is called Pilaloha, while, as above mentioned (No. 44), the Chipuya of Patna is the Chapti of Mungger. The two fishes, although both may be called Cyprini, have very little resemblance.

48. The first Vaghra of Mungger (B. No. 58) at Patna is named Loya.

49. The Bangjhi Rewa of Mungger (B. No. 60) at Patna is called merely Rewa.

50. The Bhangnathi of Mungger (B. No. 62) at Patna is called Bhangna.

51. The Mirki or Nayen of Mungger (B. No. 64) is at Patna called Mirga. In the Son this fish is most excellent.

52. The Kalbango of Mungger (B. No. 65) and Patna is the same fish.

53. The same is the case with the Rahu (B. No. 66) which, during the whole fair weather season is by far the most common fish in the markets of Patna. No pains being bestowed on the perfection or preservation of any thing, by far the greater part brought to market is quite young,

and small, in which state this fish is very poor eating; but very fine ones may be usually procured. Those from the Son are uncommonly good.

54. The Katla of Mungger (B. No. 68) and of Patna is the same fish. It is not near so common as the Rahu.

55. The Tor of the Ronggopur list (No. 103) at Daudnagar on the Son was called Kajra, and is one of the best fresh water fishes that I have tasted. It grows to fully as large a size as the Rahu.

56. The Kurchha of the Ronggopur list (No. 101) at Patna is called Kursa, evidently the same name.

57. The Dadhai of Mungger (B. No. 69) is at Patna called Darhi, as is the case at Nathpur (P. No. 114). I consider Darhi as the real name in the Hindi dialect, and Dadhai is probably a careless orthography of the same word.

58. The Pongthiya of Mungger (B. No. 70) and Patna is the same, and in the interior of Behar is by far the most common fish.

59. The Mara of Patna is the same with the fish so called in the Puraniya list (No. 125), which confirms my opinion, that the name Marowa given to it at Mungger (B. No. 73) is an improper orthography of the same name.

60. The Jongja of the Puraniya list (No. 128) is at Patna called Dengra, a name which in different parts of the country is given to several Cyprini.

61. The 3rd kind of Dyangra, or the Konghari of the Puraniya list (No. 132), is at Patna called Gohama.

62. The eel called Anhai in the Puraniya list (No. 134) at Patna is called Angdhai evidently the same name; but which orthography is right, I cannot take upon myself to say.

Crustaceous fishes are abundant in the Ganges, and are of three sizes. One, as large as a small lobster, is called Gorra; a second, like a prawn, is called Jhingga, is the best, and is the same as that mentioned in Bhagalpur; the third and least, like a large shrimp, is called Echna. I observed no crabs.

Insects, especially the white ant, are not near so troublesome as in Bhagalpur. Locusts (Tiddi) have been seen, but very seldom; nor is the damage that they have done so considerable as to have attracted much notice, as by far the greater part of the natives have never heard of such an animal. Muskitoes are not at all troublesome, except in Patna, and there are not near so bad as in Calcutta. It is observed that an easterly wind drives them away; and that they return when the wind blows from the west. In fact, the easterly winds do not seem favourable to animal life. The common fly at Patna is the greatest nuisance of the insect tribe, and in the city is almost intolerable. Honey bees are only numerous in the wilds, and there the Bhungihar and Musahar collect a little honey; but, as the property has not been fixed, and as no rent has been demanded, the quantity of either honey or wax that is brought to market is quite trifling. The honey, indeed, serves occasionally as a repast to the low castes, or to venturesome boys; but the wax is in general lost. In every part the shells of various moluscæ are gathered for burning into the lime used in chewing. These shells abound in the reservoirs preserved for watering the fields, and in the low lands near the Ganges. I here may remark, that in these low grounds I found the living animal of that species, which I saw in a fossil state in the Asurhar of the Bhagalpur mountains, which is therefore by no means a marine production, as I was inclined to think when I described that district.

CHAPTER II.

OF THE PLANTS

This district is in general too much cultivated to be a good field for a botanist. I however met with many plants which I had not before seen, and the species differ more from those near Calcutta than those of Ronggopur, Dinajpur, or Puraniya, the difference in the dryness of the air having more effect than the difference of latitude.

The whole of the waste land that is inundated as calculated in the Appendix amounts to 26 miles, and almost wholly in the islands or low banks of the Ganges, is covered with tamarisks and reeds, and devoid of trees. Of the high but level land that is waste and overgrown with ligneous plants, amounting by the above statement to 384 square miles, probably 100 miles are covered by mere scattered bushes, and the remainder, 284 miles, is occupied by woods. Of the 123 miles of hills, almost a fourth part may be quite naked, leaving about 90 miles for woods; so that the whole forests in Behar, for there are none in Patna, may amount to between 370 and 380 square miles; and, including tamarisks and other bushes, there may be in all about 480 or 490 square miles covered with woods or thickets. The larger proportion by far of the low thickets in these districts, amounting at least to 80 square miles, consists of scattered bushes of a species of *Zizyphus* (Janggali Bayer), which occupy the poor lands towards the Son. None of the hills here are cultivated, which perhaps is the only cause specified in the account of Bhagalpur, which does not also operate in Behar in reducing the woods to a stunted condition; and, the extent here being comparatively small, these causes produce a stronger effect; so that the bushes which the blacksmiths cut for charcoal are very stunted. Whether or not the woods in the S.E. corner of Behar are annually burned, I do not exactly

know; but they probably are; and, although the woods there are very extensive, they are totally inadequate to supply the country with the few posts and beams that are required for building.

The observations made on plantations in the accounts of Puraniya and Bhagalpur are applicable entirely to these districts, where in many parts Mango trees and palms have been reared to a very superfluous extent; and this being an indulgence of idle vanity is a fit object for being taxed. The different species of fig too that are so commonly planted, and which are totally useless except as forage for elephants, are fostered by an idle vanity, that need not be spared, and taxing them, while various useful trees might be exempted would perhaps induce the natives to rear kinds that might supply the carpenter, joiner or cabinet maker with valuable materials, which in this country are surprisingly scarce, considering the numerous trees fit for the purpose that are the spontaneous production of similar climates and that no country can be more finely wooded.

I now proceed to enumerate the trees, which commonly grow in these districts, referring as formerly to the accounts of other districts, where nothing new occurs.

1. The bamboo is planted in a few gardens, rather as an ornament or curiosity than for use; and at Patna large bamboos are dearer than even at Calcutta, although they are cultivated on the opposite side of the Ganges. In the interior they are not procurable. The kind that has been planted is called Chal-Bangs, and is the *Arundo arborvasaria* of Rumph. Wherever attempted to be cultivated, it has thriven, and to its scarcity may be attributed much of the wretchedness in the huts of the natives.

2. In many parts of the Rajagriha hills, where the soil is tolerable, a belt of the small wild bamboo surrounds their base; but as no pains are bestowed on preserving them until full grown, very little advantage is derived from this source. The southern hills of Sheykhpurah and Nawada give a considerable supply of this bamboo, which

entirely resembles that of Bhagalpur, called Tanai-bangs; but owing to the same want of care this supply is not more than adequate to serve the south-east parts of the district. Sahebgunj and its vicinity procure bamboos from Ramgar, and all the banks of the Son and Ganges are supplied from Rautasgar.

3. In the gardens near Patna a dwarf bamboo has been introduced from China, if we may judge from its name (Chiniya-bangs). It grows only to the size of a shrub; and its branches form clusters (*fasciculi*). It has now become an officinal.

4. At Patna and Sahebgunj a few cocoa-nut palms have been planted as a curiosity; but their fruit does not come to maturity.

5. The Khajur palm is every where abundant, and every where cut for its juice, so that it is an object of very considerable importance. The season lasts from Kartik to Phalgun, that is, from the middle of October to the Middle of March, or five months; but on the whole each tree does not bleed more than from 25 to 30 days in the season, the process being nearly the same as described in Bhagalpur. The accounts of the produce vary much, as might be expected, from its being liable to a tax; but I have no reason to think that the produce or value stated in the account of Bhagalpur are materially erroneous. No sugar is here made from the juice of this palm. Mats are made of its leaves, but in these districts the leaves of the next mentioned palm are preferred.

6. The Tar or Tal palm has been fully described in the account of Bhagalpur (No. 6); and in this district is so abundant that in the heats of spring its juice is scarcely saleable. This is an evil, that would be remedied by the mode in which I proposed to levy the tax and has induced the extractors to fall on various means, by which the flowering season may be retarded or altered. The Tal palm, as I have said, naturally and usually flowers in the heat of spring, and such as flower then are called Sahi. These give a great quantity of juice, probably on an average 6 mans (492 lbs.); but this being so plenty, sells only for about one

Rupee. Some few trees, that from unknown causes do not flower in spring, push out their flowers in the cold season, and give a scanty supply; but in spring many are rendered artificially barren by breaking off the flowering bud (*spatha*), as it begins to form. These also flower in the winter season, and are called Basanti. They do not give above $2\frac{1}{2}$ mans of juice, but this is of as much value as the 6 mans which a tree gives in spring. Either the male or female will answer for the spring or winter crop; but the females alone will yield juice in the rainy season. When this is wanted the fruit is allowed to form, and afterwards the point of the spadix, or stem which supports the clusters, is cut and allowed to bleed. This does not prevent a great many fruit on each cluster from coming to maturity. Palms managed thus are called Ghour. The fruit ripens in August; but many of the stems continue to bleed until October. A species of insect, which I have not been able to procure, sometimes attacks the heart of this tree, and occasions it to languish. The remedy is to cut a hole, about six inches long and two wide, entirely through the middle of the stem, and four or five feet from the ground. The stem is found hollow, and a great deal of rubbish, like saw-dust, falls out; but the palm soon recovers, nor do I know what becomes of the insect. It probably undergoes a change, and comes out by the hole.

7. The *Terminalia Catappa* is found in gardens, and is called Kath-Badam, or wild almond; as the people here have learned from those of the west, and the real almond (Badam) is a very different tree; while at Calcutta the *Terminalia* is the only Badam known. The Catappa, however, in these districts is an exotic, and I suspect is so in all parts of India proper, and has probably been introduced from Java.

With respect to the Myrobalans, I am still in as great doubt as when in Bhagalpur, nor can I say which of them ought to be considered as specifically different in the botanical acceptance of the term; neither have I found the fruit of any of them ripe.

8. The Bahera at Patna is a Myrobalan as large as a walnut found only about towns, and its flowers are said to have a very offensive smell, but I did not see them. It is therefore the 9th number of the Bhagalpur list.

9. At Duriyapur I found the Myrobalan called Bahera with a smaller fruit, but did not see the flower, nor is the tree common.

10. The Asan is found in the forests of the Sahebgunj and Nawada divisions, and is applied to rear the silk-worm, called Tasar in Bhagalpur, but here most commonly known by the name Koya. The only kind almost used for thread is that called Dhabha, and is chiefly reared in the beginning of the winter; but in order to procure seed, as wild is not used, a small crop is reared during the rainy season. The place, in which the worm is reared, is here called Kura or Koyar, and entirely resembles the Ara of Bhagalpur. In Sahebgunj it was stated that there were 20 Kuras employed in the cold sason, and in each there are from 3 to 8 men (Hasuyas), in all about 80, who pay for each Kura from 4 to R. 5 a year to the landlord. Each Kura rears from 5 to 10 Karis (1100) of cocoons, for which the petty dealers pay at the rate of R. 5 a Kari, mostly in advance, and again sell to merchants or weavers at the rate of R. 7 a Kari, having a nominal gain of 40 per cent, but the loss by advances is considerable. On these data we shall have the following results:

Each Kura makes on average $7\frac{1}{2}$	Rs. A.
Karis worth at advance price ...	37 8
Deduct rent	4 8

Profit Rs. 33 0

Then each man, there being on an average 4 in each Kura, has for gain Rs. $8\frac{1}{4}$. 20 Kuras at advance price, will produce cocoons to the annual value of Rs. 750 and at market price the value will rise to Rs. 1050. A few men are employed to rear the seed in the rainy season from cocoons, that through the spring have been preserved in cool places, free from smoke. The cocoons that have burst, sell at

1 Rupee a Kari, but as their number is trifling, this need not be brought into account. These men, perhaps 8 or 10 in number, supply their neighbours, and their gain must be deducted from the profit above mentioned, which may reduce it 10 or 12 annas for each man.

In Nawada it was stated that there were 40 Koyar in each of which there were 2 or 3 men employed, and that each Koyar made only 3 Karis of cocoons.

Forty Koyars therefore give 120 Karis of cocoons worth at advance price Rs. 600 and there being employed about 100 men, each will gain about Rs. 6. The market price of the whole will be Rs. 840.

In this division a very little Sarihan is made from seed, the spontaneous production of the forests, which sells at about one-third lower than the Dhabha reared from seed that has been preserved at home.

All the absurdities of purity and chastity that are attended to in rearing the animal in Bhagalpur, are here in full force and deter all, except the most wretched tribes, from engaging in a pursuit attended with such restraint; and in fact most of the material used in the district is brought from the southern hills of Ramgur, where poverty induces the people to undergo such privations. The account given here of the seed and kinds, it must be observed, agrees with that mentioned in Tarapur, and serves to confirm it.

11. The Terminalia, mentioned in my account of Bhagalpur (No. 12) by the name of Kahu, is known here also by the same appellation, and is very common about villages and the skirts of plantations, while the Asan is found only in woods. What the reason of this preference may be I know not. The carpenters of Patna do not use the timber of the Kahu; but I suppose that it is very strong and in much request for coarse joiners work in the country.

12. The Terminalia, which in the Bhagalpur list was called Arjan (No. 13), is here reared in the same manner as the Kahu, and is called

Kahuya, if that can be considered as a different name. In Nawada and Sahebgunj its timber is thought valuable and strong.

13. I was assured at Gaya that in the forests of that division the Dha mentioned in the Bhagalpur list (No. 15) is found, but I did not see it. A Gum or Resin (Gond) is said to be procured from this tree, and collected for sale; but at Patna it is not known to the druggists, at least by this name.

14. The Teak tree (*Tectona grandis*) has been introduced both at Gaya and Patna, and the English name (Teak) has been adopted or changed into Tiki, as the natives do not yet know that it produces the wood with which they have long been acquainted by the name of Sagoyan. It does not seem to thrive, but has now been introduced as an officinal.

15. The *Nyctanthes arbor tristis* of Linnæus is a very common tree, both about villages and in woods. In those of Nawada it is called Sundri; in the villages it is called Singgarhar. The flower is of use as a dye; the flower, bark and leaves are officinal; the timber is considered as useless.

16. Among the hills of Nawada I found the species of *Vitex*, which in Bhagalpur was called Morawa. Here it is known by the name of Tikaniya.

17. Near Patna is found another species of *Vitex* called Sindayar, a small tree used in medicine, that I have not been able to refer to any species hitherto described.

18. The Takahar is a *Cornutia* or *Premna*, common about the villages near the Ganges, and has a very strong hircine smell. It seems to be the same with the Dankari of the Tonggopur list. The leaves are officinal. The wood is used only for fuel.

19. The Gandhai of the Bhagalpur list (No. 19) is here called Gundhari, and is a common officinal about villages. Its wood is useful only for fuel.

20. The same confusion prevails as every where else respecting the term Gambhar, which at Patna I found applied by the druggists to the

Trewia with hairy leaves (No. 153), while at Duriyapur the Gmelina mentioned in the Bhagalpur list (No. 20) was brought by this name. The Gambhar wood is used for all kinds of drums; but whether or not both the Gmelina and Trewia are indiscriminately used, I cannot exactly ascertain.

21. The Cordia, which I take to be the Vidimaram of Rheede (B. N. 22), I found in the hills of Nawada, where it was called the Bara or great Koraiya, while the name Chamari Koraiya was given to a species of Nerium that will be afterwards mentioned (No. 33).

22. The name Lasaura, that was given to the last mentioned species of Cordia, is in this district written Lisaura, and Nisora. The former name was given to a tree, which is common about the villages near the Ganges, and may be a mere variety of the Lasaura of Bhagalpur, but its leaves are very blunt. I did not, however, see it in all its stages of growth, and shall not speak decidedly on the subject. Its timber is reckoned very fit for the poles of palanquins, and for the yokes used by draught oxen, because it is light and strong. The bark, like that of the Lasaura, is used for matches.

23. The Nisora is the species of Cordia, which I consider as the *Arbor glutinosa* of Rumph, and which I think different from the Vidimaram of Rheede, although both trees have a strong affinity, and probably differ little in quality. The distinguishing these three trees is therefore of little or no importance.

24. The species of Cordia, which at Bhagalpur (No. 23) was called Jhandha, is at Patna called Gondi. It is an officinal.

25. The species of Budleja called Sapoti in the Ronggopur list (No. 53), in this district is called Ban samalu, and grows about Patna, where it is used in medicine.

26. The *Ehretia lavis* of Willdenow, which in the Bhagalpur list (No. 24) is called Hading, in the woods of Nawada is called Dangtrangga, from the property of staining the teeth red, that is common to several kindred species.

27. The *Bignonia indica* in the woods of Nawada is called Daka, but in the villages towards the Ganges, it is called Sonpatta, evidently the same with Soinpat, by which name it is known in Bhagalpur (No. 26).

28. In the forests of Nawada I found another species of Bignonia, which was called Pandor, evidently the same name with the Pangdar given also to a species of Bignonia; but the two species are different, the plant of Nawada having serrated leaves, while those of the tree growing in Bhagalpur (No. 27) are quite entire.

29. The *Schrebera swietenoides* of Dr. Roxburgh is found in the woods of Nawada. In the account of Bhagalpur I have noticed its affinity to the genus Bignonia, and it is here called Ghonta, a name which in the Ronggopur district is in fact given to a species of Bignonia (R. No. 57).

30. The *Flos convolutus* of Rumph is not common, but it is found in villages. It is called Golachin, and this name seems to have been corrupted by the Bengalese into Golongcha, because they had a plant so called. It seems to me to be an exotic. It is an officinal.

31. At Gaya a species of Nerium, which Dr. Roxburgh in his MSS. calls *tinctorium*, was brought to me as the true Koraiya of these districts; and it was said that its seeds, which are intensely bitter, are the Indrajav much used by the natives in medicine. This plant is not a native of these parts, but has found its way into some gardens; and I strongly suspect that the people who showed it to me as the Koraiya and Indrajav were mistaken, and that these names belong to the species of Echites which Willdenow calls *Nerium antidysentericum*, as I have said in my account of Bhagalpur (No. 30). I did not observe this plant in these districts, and the natives are therefore probably not well acquainted with the subject.

32. The Nerium mentioned in the Ronggopur list (No. 60) by the name of Adkhuri, was shown me in the hills of Nawada as the Koriya, and has such a resemblance to the last mentioned plant,

that the natives might readily mistake the one for the other.

33. The fine species of *Nerium*, mentioned in the Bhagalpur list (No. 32) as the Dudkoraiya, in the Nawada forests is called the Chamari-Koraiya. The turners of Patna use the Koraiya chiefly, but whether it is any of these *Neriums* or the species of *Cordia* above mentioned, (No. 21), I cannot ascertain.

34. The *Cerbera Thevetia*, which was introduced by Dr. Roxburgh into the botanical garden so late as the year 1801, and reared from seed which he procured from Pennsylvania, has now become a very common ornament in the gardens about Patna; and the people have lost all idea of its being an exotic. A Brahman of Mungger brought it to me as the Pitsugandhi karbi of the vulgar dialect, while in his books he has no less than five Sangskrita synonyms for this plant; and a druggist of Patna brought it to me as the Jarad Kanel, which had been used time immemorial in the shops of that city. Jarad-kanel, it must be observed, signifies yellow oleander, and it is possible that the American plant may have been mistaken for some other of the *Apociniæ*, with a large yellow flower, that I do not know.

35. The *Strychnos (nux vomica)* of botanists here, as well as in Bhagalpur, is called Kungchla, and is one of the most common trees in the woods. On the most naked of the hills I found in fruit some dwarf plants, each berry containing only one seed; but I cannot exactly pretend to determine whether this was owing to the aridity of the soil, or to a difference of species.

36. Under the name of *Strychnos potatorum*, as Willdenow observes, botanists seem to include two species. The Nirmal, which I saw in Sheykh-purah, entirely resembles the description given by Willdenow, and has its leaves veined. The fruit is used in medicine as a topical application for inflammations of the eye, and is sold in the markets to clear turbid water.

37. The *Bassia*, as in Bhagalpur, is called

Mahuya. In the wild parts of Nawada many trees of this are scattered on the high poor land, that is cultivated with pulse or sesamum; but the whole number of such, when compared with the total amount raised in the district, is but small, and by far the greater part is reared in plantations, generally intermixed with mango trees, which are scattered through every part of the district. The wood at Patna is reckoned strong, and is used for posts, beams, doors, windows, and other joiner's work; but it does not take a polish, nor is it so durable as the Sakuya or Shorea. The oil expressed from the kernels is used in medicine, and for the lamp; but is not eaten. Some of the poor use the flowers for a part of the year, instead of grain, but to a much smaller extent than in Bhagalpur. As these flowers supply nourishment, the distilling from them deserves more encouragement than that from sugar, because in all countries one of the means most capable of alleviating famine will always be found in employing, during ordinary seasons, a large proportion of vegetable nourishment in making strong liquors. Grain is, no doubt, that which ought to be in general preferred; but Mahuya has the advantage of being less likely to be affected by the seasons which produce a scarcity of grain. In Nawada, where most of the spontaneous trees grow, it was stated that the average produce of each tree was one man of that country weight, equal to $31\frac{1}{5}$ sers Calcutta weight, or to about 64 lbs. avoirdupois, which on the spot sells to the trader for eight annas. In Duriyapur again, where most of the trees are planted, the produce of each was stated at from $\frac{1}{2}$ to 3 mans (56 s. w. a ser, 6 sers, to the paseri), or from $34\frac{1}{2}$ to 207 lbs., worth at the rate from $1\frac{1}{4}$ to 3 mans a rupee. Most of the trees are retained by the Zemindars in their own management. Sometimes they hire people by the day to gather the flowers, and sometimes they make an agr  ement with poor people to receive a certain quantity for their plantation, the gatherer taking the surplus for his trouble. The flowers are usually gathered twice a day, at sun-rise and noon.

38. The *Mimusops Elengi* of botanists, which at Bhagalpur (No. 36) is called Maleswari, is here called Maulsari and Mulchari, nor do I know which orthography is most correct, but the names are evidently the same. The tree seems to be an exotic in these parts, and is not common. The bark and flowers are officinal. It is applied to no other use.

39. The Khirin, Kshirni, or *Achras dissecta*, W, is here too scarce to be used as timber, but its fruit is sold in the markets, and among the natives is considered very good. This same plant is no doubt also the *Mimusops obtusifolis* of the Encyclopedie.

40. The Gab, or *Embryopteris glutenifera* of Dr. Roxburgh, is planted about villages; and the fruit is used in paying the bottom of boats to exclude worms and preserve the timber. Fishermen use it also for preserving their nets. The fruit dyes silk black. Both bark and fruit are officinal. Its timber is fit only for fuel. The bark of the Palas root is here called Raswat.

41. The *Diospyros cordifolia* of Dr. Roxburgh here, as well as in Bhagalpur (No. 39), is known by the name of Makarkend, and is found on the southern hills.

42. On the same hills is also found the *Diospyros*, which in the Bhagalpur District (No. 40) is called Kend. It is not common, nor is it allowed to grow to such a size as to produce ebony.

43. The *Gardenia* with a saponaceous fruit, mentioned in the Bhagalpur list, No. 44, is pretty common in the woods of these districts, and as at Mungger, is called Karhar.

44. The *Gardenia*, which in the Bhagalpur list (No. 45) is called Popro, in the woods of Rajauli is named Papri. It is said that from its seed the poor of that vicinity extract an esculent oil.

45. In this district the *Gardenia uliginosa* of Willdenow is less common than in any part of India where I have been. It is however to be found in the woods of Rajauli, where it is

called Pindara, a name in different parts variously written Pinder, Pindalu and Piralu.

46. The Morinda, which in the Bhagalpur list (No. 47) is called Katbela, is here called Bankatahal or wild Jak, a name given in Bhagalpur to another species. It is only used in medicine.

47. What is called Bankathar in the Bhagalpur list (No. 48), is here called Achhuya or Achh or Al, and is reared in gardens, the root being used as a red dye.

48. The Kadam of the Bhagalpur list is found pretty common about villages, and is here also called Kadam. The wood is considered as of very little value, and the tree seems to have been everywhere planted as an ornament. I am inclined to think that both in Bengal and Behar it is an exotic; nor do I recollect to have ever seen it in a forest that could be considered as primitive.

49. The Karam of the Bhagalpur list (No. 50) is here known by the same name and is found in the woods of Rajauli. The cabinet makers of Patna give it a polish, but do not consider it as a valuable timber.

50. The Gulli Karam of the same list (No. 51) in the woods of Rajauli is called Khaora, a name with which the workmen of Patna are not acquainted. It is probable that under the name of Karam they include both this and the last, as the quality of both is nearly the same, and probably both would be found well fitted for ship-timber, so as to justify their botanical name, *Nauclea*.

51. The Khongta of the Bhagalpur list (No. 53) is known here by the same name and is found in the Rajauli forests.

52. The Varuna or Cratava of this district is the same with that of the Bhagalpur list (No. 60), and is very common about villages, although very useless. The bark is used in medicine, and the tree is often called Barungol, evidently a different orthography for Varuna or Vorna.

53, 54. The two species of Euphoria usually called Litchi and Longan, their Chinese names, have been introduced at Patna, but hitherto with little success. The latter is called Ampich

(Mango-peach) and even in China is a wretched fruit.

55. The common Soap-nut (Ritha) of this district, although it is the *Sapindus emarginatus* of Willdenow, is not a *Sapindus*, but an *Euphoria*. It is pretty common about villages, and grows to a good size; but its timber is little, if at all used, except for fuel. The fruit is used for washing silk and woollen cloths, and in medicine.

56. The Sakuya, or Sakhuya, is the same with that of the Bhagalpur list, and is confined to the southern forests, where it is found only in very trifling quantities, and is very much stunted, partly by being cut whenever it is fit for the smallest use, and partly by extracting the resin, which here, as well as in Bhagalpur, is called Dhuna, and is used for incense. The quantity of this resin procured in these districts is quite inconsiderable; but pretty large quantities might be had at Patna, and it seems to be a substance that might be useful in the arts, but it is dear. If of a fine quality, it usually sells at five Rs. a man (76 s. w. a ser), or about 76 lbs.; but the ordinary kind costs only two Rs.

The kinds of Citrus which I have found in the gardens of these districts are as follows.

57. The *Citrus decumanus* of botanists derives its Indian name from Batavia, from whence it would appear to have been first introduced, and the servants of Europeans have corrupted this name no farther than Batabi, but those who seldom speak to Europeans, in order to give it a greater affinity to their own language, call it Mahatabi. Both at Patna and Gaya it produces a tolerable fruit, which ripens in the beginning of the fair weather, and lasts throughout the cold season, when scarcely any other fruit is procurable. Except at these two places it has been seldom planted.

Oranges, that should be sweet, are pretty common in these districts, but are most execrable, and something very peculiar in the soil or situation would appear to be required to fit a place for producing good fruit of this kind. In the whole

extent of the Company's territories in India proper, I know of only three places where good oranges are produced: Srihatta commonly called Silhet, Chandpura near Dhaka in Bengal, and Satghar at the foot of the passes in the mountains leading up to Bangalore from Madras.

58, 59. In these districts there are two kinds of sweet oranges, the Naranggi and Keongla or Kaongla, which differ in the size of the fruit alone. When ripe, the skin of the fruit in both separates from the pulp and the fruit is very much depressed at the poles. The Naranggi is the same with the Citrus so called in the Bhagalpur list (No. 68). The Kaongla is the *Aurantium sinense majus* of Rumph, vol. 2, p. 113. The petiols of both are seldom winged as that author represents.

The insipid kinds of Citrus are here two.

60. The Citrus which has a watery insipid juice, and which has been mentioned in the Ronggopur list (No. 102) by the name of Puni Jamid, is at Patna called Gagar. 15. 15.

61. Very nearly allied to the above is the Taba of Gaya which has subcordate leaves, and a round fruit as large as a man's head, with an insipid juice.

The acid kinds of Citrus are numerous.

62, 63. The Sarbatiya Nambu of the Bhagalpur list (No. 67) seems to me to be unnecessarily divided into 2 kinds at Patna; nor can I perceive any essential quality by which they are to be distinguished. They are called Chakotra and Karna, which latter name is at Bhagalpur given to a very distinct fruit (No. 66).

64. Very nearly allied to the Kangta of the Ronggopur list (No. 98) is the Jhauya of Gaya, a globular citron about 3 inches in diameter with a rough thick skin.

65. The Jamiri of Patna I did not see in fruit, and therefore do not know if it is the same with the Jamir of the Ronggopur list (No. 97); but the foliage seems different.

66. The Khagzi or small lime is the same with that of the Bhagalpur list (No. 64) and other districts.

67. The Angthil of the Bhagalpur list (No. 69) has been mentioned as the *Chalcas paniculata* of Linnaeus. One of the most common stunted trees on the arid hills of those districts is known by the same name; but it is also called Sorai. Having neither found flower nor fruit, I am doubtful whether or not it may be the same; but the foliage strikes me as not being exactly similar.

68. The Bel of the Bhagalpur list (No. 70) is not here so common as in that district, but is not unusual both in woods and about villages.

69. The kindred tree, which in the Bhagalpur list is called Kayetbel, is here called Kangyet and is not uncommon. It is used in medicine. The timber is considered as good for nothing.

70. The Bakayen of the Bhagalpur list (No. 73) is here known by the same name. It is only common about villages.

71.. The Nim of the Bhagalpur list (No. 74) is here known by the same name. It is said that in very old trees there forms a sweet smelled wood, like sandal, or more analagous perhaps to *Allochum*.. I could not however procure any such.

72. The Tungd of the Bhagalpur list (No. 76) is here also known by the same name. What grows about villages is only used as a medicine or dye; and all the timber used by cabinet makers is brought from the forests of other parts.

73. The Salhar or Salai of the Bhagalpur list, is one of the most common trees in the woods of Rajauli, where it is called Sali. I have already stated, that Mr. Colebrooke considers this as the tree which produces olibanum or frankincense, and I have mentioned some difficulties that occur in adopting this opinion. The druggists of Rajauli informed me, that they use the resin of this tree in medicine, and call it Birojabadi; but from all their shops I could not procure a specimen that was worth the taking; and at Patna the Birojabadi is quite unknown. The druggists there have two Birojas, but both are evidently turpentine, the produce of pines from Nepal. The Guggul, which is the common incense used, and which is said to

be called by the Sangskrita names, mentioned by Mr. Colebrooke as synonymous with olibanum, is said indeed to be brought from the hills of the south; but it is stated to be the produce of a very different tree. Some plants of this have been introduced at Patna, and in Ronggopur I found the same tree in the garden of a Zemindar, and considered by him as the Guggul. The Guggul used at Patna comes from Calcutta.

74. About villages there are a few trees of the *Paraspipal*, so called both here and in the Bhagalpur list (No. 79). I think that both in Bengal and in Behar it is an exotic.

75. The *Pterospermum acrifolium* of botanists grows about the villages of this district, and its flowers are highly ornamental and odorous. It is called Mekchand, and is mentioned in the Ayeen Akbery (Gladwin's translation, vol. 2, p. 31) by the name of Mujgund, and as being peculiar to Maner (Muneyr). The plant is used in medicine.

76. The Bindha of the hills of Nawada is a tree of the same genus with the Guyagudi of the Bhagalpur list (No. 81), and is the same with the Gumsi of Mysore.

77. The Simal of the Bhagalpur list is here called Simar, the L of the eastern provinces being very often in the west changed to R. This tree is not here very common, but both its cotton and planks are in request; the former for stuffing pillows. For this purpose it is preferred to the cotton of the *Gossypium*, because it is supposed to have a heating quality. The wood is chiefly used for packing boxes and palanquins. The gum of this tree called Mochras is used in medicine.

78. The Telhai or Kaundhi of the Bhagalpur list (No. 84) in the woods of Rajauli is called Kaungjhi, evidently the same with the latter of the Bhagalpur names. It produces a fine gum, but I do not learn that this is ever collected.

79. The Champa of the Bhagalpur list (No. 86) is here known by the same name; nor is it common. One of the timbers in most request with the cabinet makers in Patna is called Changp,

and they say that this name is different from that of the tree of which I am now treating; but the timber comes from Nepal, and I know that there the timber of some spontaneous kinds of *Michelia* is in great request for the same purposes. The *Michelia Champaca*, so far as I know, is everywhere in India an exotic, and is only to be found planted about villages.

80. The *Anona squamosa* of botanists is here called Saripha or Shurifah, and at Patna produces very good fruit, as it would do everywhere in Bengal and Behar with a little care.

81. The *Anona reticulata* as in the Bhagalpur list (No. 89) is here called Sitaphal and Ata.

82. The *Uvaria*, which in the Bhagalpur list (No. 91) is called Gandhai, in the hills of Nawada is called Gandhaiya.

83. The Lalhiran, again of the Bhagalpur list (No. 93) in the same hills is called simply Hiran.

84. The Kari of the Rajauli hills, from its general appearance, would also seem to be an *Uvaria*, but I saw neither flower nor fruit.

85. The Asoka of these districts has not the smallest resemblance to the tree so called in Bengal, which is the *Jonesia* of botanists, and which, so far as I know, does not grow in Magadha. The Asoka of Behar is the *Uvaria longifolia* of botanists, and is now used in medicine, although I suspect it has been lately introduced by Europeans, as mentioned in the Dinajpur list (No. 51), where the tree is called Devdaru.

86. The Paniyala of the Puraniya list (No. 64) is known here by the same name, but has not become common.

87. The Baingchu of the Bhagalpur list (No. 95) is in some places here called Bengcha, evidently the same name, but among the druggists of Patna the male tree is called Bankala, and the female Phulkangtela.

88. The *Grewia asiatica* of Patna is called Phalsa, or rather Bara Phalsa, in order to distinguish it from a shrubby species that has been introduced into some gardens.

89. In the woods of Rajauli I was shown a

tree called *Dhamin*, which appeared to me to agree tolerably with the account given by Willdenow of the *Grewia populifolia*, although that is a tree of Arabia. The name *Dhamin* is no doubt the same with *Dhaman* mentioned in the Bhagalpur list (No. 96).

90. At Bar the large leaved *Grewia orientalis* of Willdenow, which in the Bhagalpur list is called *Jhungjhuni*, was called *Phalsa*.

91. The *Galgal* of the Bhagalpur list (No. 100) is here known by the same name, and is common on the hills of Rajauli.

92. The sandal tree (*Sirium* of botanists) is found pretty common about the monuments of saints, where it reaches a greater size than on its native hills. It is called *Sundul*, and its leaves are used in medicine.

93. The *Dhela* of the Bhagalpur list (No. 104) is known here by the same name.

94. The *Sidda* of the Bhagalpur list (No. 105) is here known by the same name.

95. The elegant and valuable tree of the same genus, mentioned in the Ronggopur list (139) by the name of *Jarul*, has been introduced about Patna, where it is called *Amrul*, and it may be doubted whether that name is not the same with *Amrud* given to the following tree. Although the flowers have a very different appearance and the fruits are in fact very dissimilar, yet the two trees have not only a strong botanical affinity, but their foliages are uncommonly alike. The *Amrul* is now used in medicine.

96. The *Psyidium pyrifera* is here called *Amrud* and the *Pomifera* at Gaya was called *Ambrat*; but these are evidently different manners of writing the same name; nor do I think that the two plants can be considered in a botanical sense as different species. No fruit except the mango is so much cultivated by the natives of Patna, and they have them of a tolerable good quality, which they prefer to peaches, their taste in fruit being quite different from that of Europeans, few of whom can bear the *Amrud* or *Goyava*.

97. The *Jamun* of this district is the same

with that of the Bhagalpur list (No. 107). The native physicians, from the juice of its fruit mixed with honey, prepare a fermented liquor which they give in medicine. In attempting to make it according to the instruction of a Brahman, I obtained a very bad vinegar. The Janggali-Jamun of this district does not appear to be a distinct species, and differs from the Jamun in no respect, except that its fruit is much smaller. It is called also Kath-Jamun.

98. The *Eugenia jambos* of botanists here, as in Puraniya (No. 71), is called Golab-Jamun, and is very common about towns. I am told by, a gentleman from the Isle of France, Mr. Chazelle, that this fruit readily enters into the vinous fermentation, and yields a distilled spirit of an excellent flavour both to taste and smell.

99. The *Eugenia malaccensis*, with a white fruit, has been introduced at Patna, and is called Mewajam. Although rather insipid, it is not a very bad fruit, may rank somewhat above a hip or haw, and is better than the Golab-Jamun or Rose apple.

100. The small tree, which Dr. Roxburgh has described by the name of *Grislea tomentosa*, is perhaps not different from the *Lythrum Pemphis* of some former botanists. In this district it is called Dhauli and Dhawa, and the flowers are much used as a medicine and dye. There is a great deal of it in this district as well as in Bhagalpur, where I omitted to put it in the list.

101. The apple tree (*Malus communis*) produces readily in these districts; but its fruit, although externally resembling pippins, are perhaps not so good as even that of the *Eugenia Malaccensis*. The tree is called Seo, and seldom grows above seven or eight feet high, being evidently in a climate not suited for its thriving.

It probably has been introduced from Persia by the Muhammedans, although it has acquired abundance of Sangskrita names; but the same has happened to many plants undoubtedly American, such as the goyava and custard apple.

102. The Pomegranate (Anar) is very common,

and at Patna its fruit is pretty tolerable, although none of the fine kind without seeds have been introduced. That with double flowers is called Golanar.

103. The *Mespilus Japonica* has become very common about Patna, and is better there than I have seen it anywhere else. In fact, it is a very good fruit and grows in elegant clusters. The natives call it Luttha, no doubt a corruption of the Anglo-Chinese Lauquat.

104. The peach (*Amygdalus Persica*) was no doubt introduced into Hindustan long before the arrival of the Europeans, although this would not appear to have been done in Bengal, where the European name prevails; but here the tree is called Satalu. It is common in the gardens of the natives; but, being neglected, the fruit is execrable, nor do the natives seem to like even those that have been raised by Europeans, some of which are pretty good. The tree however thrives much better in Tirahut than in Bengal.

105. The common plum (*Prunus domestica*) as would appear from its name (Alu Bokhara) would seem to have been introduced from the banks of the Caspian. It produces copiously small purple and yellow plums of a very poor quality, but fit for baking.

106. The Siras or Sirish of the Bhagalpur list (No. 115) is here known by the same name. It grows about villages, but is not common. The wood is used for the same purposes as in Bhagalpur. The bark is officinal.

107. The Karangji is a small tree that grows in hedges about Patna, and is used in medicine. It has no prickles, and like the Sirish, has doubly pinnated leaves, but I have seen it nowhere else, nor can I trace it in any botanical works that I possess.

108. In the neighbourhood of Patna has been introduced a species of Mimosa, which at one time Dr. Roxburgh suspected might be that called *Unquiscatti*, and which is distinguished by having a sweet pulp round its seeds, on which account, if I re-collect right, it is now called *M. dulcis*. It is

used in medicine. Although I have no doubt of its being in this country an exotic very lately introduced, the druggists call it Talmakhana.

109. The Sami of the Puraniya list (No. 76) is here called Sayen, the former being the sacred, and the latter the vulgar pronunciation of the same word. It grows about villages, but is not common, although used in medicine.

110. The Khayer or *Mimosa Catechu* of these districts is exactly the same with that of Bhagalpur. It is confined to the woods of the south-east part of Behar, where it is kept very stunted by those who prepare the extract, although the quantity procured was stated to be very trifling. In Sahebgunj it was stated, that about 400 persons men and women are employed part of the year, and in Nawada 40 persons were mentioned. About 140 of these persons are fishers, and not only make catechu, but collect timber, bamboos and leaves for platters, so that the quantity of catechu, which they make, is very inconsiderable, and may amount to about 50 or 60 mans. The other 300 work all the cold season, except during the rice harvest, and may make nearly about the same quantity as in Bhagalpur, that is about three mans or 270 lbs. each, but this is worth to them at least double of what the wretched creatures in Bhagalpur receive, as the people here are paid in money at the rate of four rupees a man. They pay no rent.

111. The Babur of the Bhagalpur list (No. 120) is here known by the same name and is pretty common. Its wood is much valued. No one gathers the gum, although it is used in medicine. The bark is a most valuable tan and few trees seem to be more worth planting.

112. The Guhiya babur of the Bhagalpur list (No. 121) in many parts of the district is known by the same name, but in the woods of Rajauli it is called Sem, which I have no doubt is the same word with Sayen Sangi and Sami. This is the name of one of the 9 sacred plants of the Hindus, but as I have said in my former accounts the name is variously applied to the last mentioned tree

(No. 111), to No. 109, and to the *Prosopis aculeata*. The Guhiya is very inferior to the Babur, as it does not grow so large, as it yields little or no gum, and as the bark when cut, has a most intolerable stench; but it is an excellent tan, and the wood is as strong and durable as that of the Babur.

113. The *Mimosa cinerea* of botanists is a small tree of a very stiff rugged appearance, and generally grows on arid hills, but has ornamental flowers and is used in medicine. On these accounts it has been planted in the gardens near Patna and is there called Pahariya Sayen.

114. The Tamarind in this district is called Imli, is not so plentiful as in Bhagalpur, but more common than in Puraniya. Near Patna the fruit of each tree will bring from $\frac{1}{2}$ to 5 R.; in the interior the value is much lower, but the fruit is always saleable. I am told by the French gentleman before mentioned that of many fruits which he has tried to ferment, this gives the liquor most resembling wine. It must be mixed with sugar before fermentation, but the tamarind regulates the fermentation of the sugar, so as to produce a strong clear well flavoured vinous liquor, with a degree of briskness resembling that of champagne.

115. The *Cassia fistula* is here called both Amaltas and Bandarlauri, is not common and is used only in medicine.

116. In the gardens near Gaya I found a very ornamental species of Cassia, called Velayeti-Jainti, that is European Sesban, but whether or not it was introduced by any gentleman from the Botanical Garden at Calcutta I could not learn. I cannot trace it in any of the botanical books that I possess.

117. The Sappan wood has been introduced at Patna, where it grows very well, and is called Bakam, but has not become common, although the wood is imported.

118. The *Parkinsonia aculeata* has made most extraordinary progress, as it is only a very few years since it was brought to India by Dr. Roxburgh, and now it is the most common tree

in hedges near Patna, and has spread to many other parts of these districts.

119-122. The Kangchnar or Koenar of the Bhagalpur list in these districts is called Kachnar. There are here four kinds, two having hairy leaves, and two smooth; while one of each has red, and the other white flowers. Mixed in the same plantation the different colours of their elegant and odorous flowers add much to the beauty of the view.

123. The Mahola of the Bhagalpur list (No. 129) is here called Maholi, a mere difference in gender, the people here considering the plant female, while in Bhagalpur it is reckoned male.

124. The *Bauhinia tomentosa* of botanists is cultivated in the gardens of Patna, and as it is supposed to have been introduced from Nepal, is called the Nepali Kachnar. It is a small tree used in medicine, and grows in Mysore as well as Nepal.

125-126. Both the red and white varieties of the Vokpushpo of the Dinajpur list (No. 72 and 73) are found in the gardens of this district, and are both called Agasti, a word evidently the same with Agaty, the name which according to Rheede the tree bears in Malabar.

127. The Sesban of Egypt is here named Jaingti, evidently the same with Jayanti, by which it is known in Puraniya (No. 83). It is not at all common.

128. The *Robinia mitis* of Linnæus is found about towns, and is called Karuyani. It is used chiefly as a medicine.

129. The Pharhar of the Bhagalpur list (No. 130) is very common in these districts, being planted by the sides of wells to serve as the fulcrum, on which is supported the lever, with which water is drawn. Any cutting immediately takes root and the tree may be pruned with any severity without danger of being killed.

130. The Pangdan of the Bhagalpur list (No. 132) on the hills of Rajauli is called by the same name, and is pretty common.

131. The Paras of the Bhagalpur list (No. 133) is perhaps the most common of the spontaneous

trees in these districts. The bark of its root, used for caulking boats, is not here called Gab; it is only known by the name of Raswat. The seed, which is used in medicine, is called Paraspapra. A gum exudes from this tree, which has some affinity to those called Kino in Europe. It is called Chuniyagond or Koyankuni, and would appear to be a valuable medicine.

132. In the hills of Nawada is found the Paysar of the Bhagalpur list (No. 134). It is not considered here as the red Sanders.

133. The Chagalnadi of the Bhagalpur list (No. 135) is in this country called merely Chagla. It is found in the forests of the south.

134. In the same places is also found the Satsal of the Bhagalpur list (No. 136), but it is quite stunted, and Patna is supplied from the Ramgar district and Rautas (Rotas R.).

135. The Dalbergia, called Sisu in the Purniya list (No. 87), is here called Sisau, and does not grow spontaneously, but has been planted round many mango groves. The Sisu timber that is used comes still chiefly from the low forests of Nepal, but in Phatuha the people have begun to cut their plantations, and trees from 25 to 30 years old are worth 3 or 4 rupees; and older ones bring so high as 7 R., which in this country is a great sum.

136. The Bhela of the Bhagalpur list (No. 137) is here a scarce tree.

137. The mango tree has, in many parts of these districts been extended beyond all reasonable bounds, and as I have before said, is a fit object for being taxed. The quality is very much neglected; nor is any tolerable fruit to be usually procured in the markets of Patna. This is owing entirely to want of care, as in Mr. Welland's garden are growing some, that are very fine, and have been introduced from Bombay. At Patna, where there are immense plantations, the fruit sells at from one to three rupees a tree; nor is the number anywhere so great, that the fruit cannot be sold. The Zemindars preserve almost the whole as their own

property, and let the trees annually; but seldom get more than half the produce. At the town of Behar this may on an average amount to 600 fruit, or one rupee a tree. At Duriyapur again the value is not above ten annas a tree, and at some places is as low as eight annas a tree, which as a bigha of this country measure, or 27,780 square feet plants 25 trees, is about $12\frac{1}{2}$ rupees for the lowest rate of each bigah. The flower of this tree is liable to be affected with a disease, which swells the whole branch into an irregular thick corymb called Amkabanda, that is used in medicine. The preparations of the fruit most used here are as follows: 1st. Amchur, which is the green fruit, before the stone hardens, cut in two, and then beaten in a mortar to a powder, which keeps the whole year. 2d. Amkakhatai, which is the green fruit cut into slices, and dried in the sun, the skin and stone being removed; this also keeps the whole year. 3d. Achar, or pickles prepared as in Bhagalpur, but with more additions, as turmeric, nigella seed, salt, fennel, and mustard seed. 4th. Morabba, or sweet-meats. 5th. Amaut, which is the juice of the ripe mango dried. Much of the timber is sold for fuel, and for making packing bozes. A tree, that will give planks 18 inches wide, sells standing at from 2 to $2\frac{1}{2}$ rupees.

138. The Piyar of the Bhagalpur list (No. 139) is found in the woods of Rajauli, and is called by the same name. Its fruit is called Chiraungji, and the kernels are brought for sale to Patna, where they are used like almonds both in diet and medicine.

139. The Kasambhar or Parmi of the Bhagalpur list (No. 141) in the woods of Rajauli is called Parambi, evidently the same name with the latter of the above mentioned appellations.

140. The Jiyal of the Bhagalpur list (No. 140) is here not at all common, but in some parts it is used as the fulcrum for the lever employed to draw water. Both bark and gum are used in medicine.

141. The Amsaheri of the Bhagalpur list

(No. 142) is found in the southern forest of these districts and is called by the same name.

142. In my list of Bhagalpur trees, I by some mistake omitted the Kusum, which is one of the most valuable timbers in that district, and is found in very considerable quantities. It is much sought after for the pestles of oil and sugar mills, being very hard and heavy. It seems to be of the same genus with the *Cussambius* of Rumph, evidently the same name, and I have little doubt that the seeds called Koon, which Gartner described, taking them to belong to a species of *Octma*, belong in fact to our plant, or to another species which grows in Mysore, where it is called Shagada or Kshandala, but in Kankan the term Kusum is used. The tree of the south indeed differs chiefly from that of Behar, in having hairy instead of smooth leaves, and its timber is equally valuable. A good many trees of this kind are annually cut in the forests of these districts, but by no means sufficient to supply all the mills, although it is thought better than the Tamarind (No. 114), Bel (No. 68), or Babur (No. 111) that are also employed. This therefore is a tree, the planting of which should be encouraged.

143. I have mentioned that in the gardens of Patna the natives have a tree, which they call Guggal, and suppose that it produced the incense of that name. In the botanical Garden at Calcutta this tree is called *Amymris subtriphylla*, but I cannot find that any account of it has been published, nor do I know from whence it came. The resin called Guggal is a dirty moist substance with little or no smell. When put on burning coals it does not flame but emits a thick smoke, which however has scarcely any more smell than the smoke of any ordinary stick, and why it has been chosen as incense I cannot say.

144. The Amra of the Bhagalpur list (No. 143) is found in these districts, and is called by the same name.

145. In many parts of these districts, both in woods and near villages, I observed a tree with very ornamental foliage, which belongs to the

genus *Ailanthus*; it is called Ghora-karan, and Achin, a name that in many parts is given to a species of fig-tree, to which this has not the smallest affinity. The tree is used in medicine, and its branches, when newly broken, have a very singular but offensive smell, which indicates its being possessed of some power. It grows chiefly in sandy lands on the banks of rivers.

146. The wild Jujub, with a very round fruit, is not very common in these districts. This tree might be rendered valuable on account of its leaves, which are a favourite food with both sheep and goats; and as it bears pruning remarkably well, and thrives in any soil, it might supply, during the whole dry weather, large herds of these useful animals, while in the rainy season, the grass that shot up in the plantations would give a supply.

147. The cultivated Jujub which has an oblong fruit, is not uncommon in these districts, and its fruit is not very bad, resembling somewhat an insipid apple; it sometimes weighs one Chhatak (877 grains). It is called Sugeva Bayer, Pend Bayer and Bara Bayer, and in the *Encyclopédie* seems to be considered as a distinct species, which the authors call *Zizyphus Mauritiana*.

148. The Chhota Bayer of the Bhagalpur list (No. 145) in this district is called Jhar-Bayer, and is used in the same manner. Vast quantities grow near the Son and its leaves are the principal nourishment of the sheep which are reared in that part.

149. The Ghungt of the Bhagalpur list (No. 147) is here known by the same name. It is found only on the hills of the south.

150. The Neuri of the Bhagalpur list (No. 148) is found on the same hills and is called Goriyara.

151. The Aongra or Aongla of the Bhagalpur list (No. 149) is here known by the same name, and is common both in woods and plantations. The fruit is pickled, made into sweetmeats and used dry in medicine.

152. The Kadrupala of the Bhagalpur list (No. 151) in the woods of Rajauli is called Kaj.

153. In every district hitherto surveyed, I have mentioned the confusion that prevails in the native nomenclature concerning a species of *Gimelina* and the *Trewia nodiflora*: nor is the confusion less here than in other parts. A male *Trewia* was here brought me for the Gambhar and a female for the Banphal. It is true that in the two plants there was some difference in the shape of the leaves, and the natives considered them as distinct species; but I am inclined to think that the differences are merely accidental.

154. The species of the same genus with smooth leaves, mentioned in the Ronggopur list (No. 194), I found also in these districts where it is called Ajan.

155. I have now procured the Pitangjira of the Bhagalpur list (No. 192) in flower, and find that it belongs to the natural order of *Euphorbiae*; but it cannot be reduced to any genus that botanists have hitherto established. In these districts it is pretty common near villages. The female is called Pitangjiya and the male Bangjha-Pitangjiya. Although it grows to a good size the timber is applied to no use.

156. The Budi of the Bhagalpur list (No. 157) is here also pretty common, but is called Masaun.

157. The *Stillingia sebifera* of Willdenow, mentioned in the Puraniya list (No. 101) as confounded by the natives with the Sisū, a species of *Dalbergia*, has in these districts become pretty common. At Patna, where they now use it in medicine, it has procured the name of Pipri, but at Gaya it is considered as the European *Ficus religiosa* (Valayeti Pipal).

158. The *Averrhoa Garambola* of the Ronggopur list (No. 186) is pretty common in the gardens of these districts, where it is used both as a fruit and as a medicine. It is called Amrakh.

159. The *Cicca disticha* of the Ronggopur list (No. 187) is here called Arphareuri, of which Horiphol used in Ronggopur is perhaps a corruption.

160. The *Ficus Bengalensis* or Banyan tree,

here as well as in Bhagalpur, is called Bar and Barkat, and is very common. In Ronggopur (No. 215) I was totally misinformed when it was stated that the sacred tree at Gaya (Akshay Bat) was different from the common banyan, which is by no means the case.

161. At Patna I find a tree called Bar, and which resembles indeed the Banyan in everything except that its leaves are smooth. Not having seen the fruit, however, I am not certain but that it may be either No. 211 or 212 of the Bhagalpur list.

162. The Gadabhar or ass Banyan tree, mentioned in the Bhagalpur list (No. 160) is pretty common in the wilder parts of these districts, and in some places it is called by the same name, but in others it is called Pakar, a name given to several other fig-trees.

163. Among these is one common about Gaya, which in the thickness and rigidity of its branches has a strong resemblance to the three last mentioned trees, but does not send roots from its branches, and its foliage has a great resemblance to the tree that will be next mentioned. I have seen it nowhere else.

164. The Pakar of Kharakpur, mentioned in the Bhagalpur list (No. 163) is one of these species which are here known by that name. This is a common tree about villages.

165. The same is the case with the *Ficus venosa* of botanists, which is also one of the Pakars of the Bhagalpur list (No. 164). In these districts this is not very common.

166. The Pipal or Pipar of these districts, as well as of Bhagalpur is the *Ficus religiosa*. One of these trees on the temple of Mahamuni at Gaya, is the celebrated Bodhi tree of Ava, which the worshippers of the Buddhas consider as the centre of the world. The word Bodhi is one of the Pali or Sangskrita names for this tree.

167. After the account of the trees of Bhagalpur was written, I procured from the hills of that district a fig-tree which was called Gadha Pipal, and in the hills of Behar it is also found and called

Pahariya-pipal. I cannot trace it in any botanical work that I possess.

168. The *Ficus glomerata* mentioned in the Bhagalpur list (No. 166) is here also called Gular, but the same name is given to several species. This is not here so common as in Bengal.

169. The Gular of the Bhagalpur list (No. 165) is one of the trees known in these districts by this name. It is not common.

170. The Katdumar of these districts is the same with that so called in the Bhagalpur list (No. 168).

171, 172. The fig-tree of Europe has been introduced into a few gardens at Patna. The Hindustani fig is a different, but very nearly allied species, which is not described in any botanical books that I possess. The fruit is tolerable, and might probably be rendered good by planting the trees against a wall, with shelter to keep off the rain, by which it is generally prevented from becoming thoroughly ripe.

173. The Jak or *Artocarpus integrifolia* is scarce in these districts, where it is called Katahar or Katahal. The produce of a tree, however, is double in value to that of a mango and the timber is about one half more valuable.

174. The Barhal of the Bhagalpur list (No. 170) is here known by the same name, or Barhar, and is pretty common, although its wood is useless; but its fruit is in great request as an acid seasoning.

175. The Seora of the Bhagalpur list (No. 171) is scarcer in these districts than in any part of India that I have seen, although its bark is in great request for cleaning the teeth, and is imported. The name is here written Sehora.

176. The most common mulberry of these districts is the same with that of the Bhagalpur list (No. 172). It is called either Tut or Baratut. Although it is no doubt one of the plants (*Morus Macassariensis* R) which Willdenow quotes for his *Morus Indica*, I suspect that it does not differ from the variety of the *Morus alba*, which this author mentions as having a red fruit. The fruit

here is pretty good and I saw several trees above 40 feet high, but its wood is of little or no value.

177. There is a variety of the mulberry with a green fruit, which is very sweet, but rather juiceless. It is called by the natives the white mulberry (Saphedtut), although it never acquires that colour. It can scarcely be considered as forming a distinct species from the *Morus Macassariensis* of Rumph, although that is at present called the *Morus Indica*. Still less can it be considered as different from the *Morus Alba* L.

178. At Patna there is a mulberry called Chhota Tut, which grows to be a small tree, because it is never cut; but I suspect that otherwise it would not differ from the *Morus Javanica* of Rumph that in Bengal is usually employed to feed the silkworm.

179. The Papita of the Bhagalpur list (No. 173) is known by the same name and is very common about Patna, but nowhere else in these districts. The natives reckon that curry made of the ripe fruit is very favourable for women that are nursing.

180. The Tarsi of the Bhagalpur list (No. 177) is here called Bara Amti and is found in the woods of Rajauli.

181. The Chhota Amti of the same woods is probably the same with the Amtuya of the Bhagalpur list (No. 178). I saw it only in leaf.

182. The common Cypress (*Meta fastigiata*) has at Patna been introduced from the west, but lives with difficulty. It is called Saro.

183. A Thuia from Nepal has been much more successful and is called Pahariya-Jhau, or Mountain Tamarisk, but the fruit, which is used in medicine, is called Barimaing. I cannot trace this small tree in botanical authors and, although I have called it a Thuia, it seems to unite that genus with the Cypresses so as to render dubious the marks by which they are usually distinguished.

These are all the trees that I can refer to the natural arrangement of Jussieu. A few, considered by this author as of uncertain affinity, shall next be given.

184. The Sajina or Munga of the Bhagalpur list (No. 179) is here called Sajna Sahajuna and Munka, various ways of writing the same names. It is pretty common and its wood is useless, but its bark, root and gum are employed in medicine, and its fruit and flower are esculent.

185. The Tita Sajna or Nanjna may be perhaps a different species of the *Hyperanthera*, although it is exceedingly nearly allied to the Sajna; but both flowers and fruit are so bitter that they cannot be used in cookery, and are only valued as medicines, as are also the other parts of the plant. In the gardens about Patna it is a very common tree.

186. The Koniyal of the Bhagalpur list (No. 180) in the woods of Rajauli is called Kaner, evidently a different way of writing the same name.

In the woods of Rajauli two trees were brought to me, concerning the place of which in the system I can form no conjecture, as I have neither found their flower nor fruit..

187. The one seems to be the same with the Dhao of the Bhagalpur list (No. 190), but is here called Siha.

188. The other is the Bhorkund mentioned in that list (No. 191), and is here known by the same name.

189. At Gaya, I was told that a certain tree called Datori produces a fruit which is sold in the markets; but I found neither fruit nor tree, and can form no conjecture concerning what the latter may be.

In these districts reeds are of very little importance. Of the 26 square miles of inundated land that are waste, one half perhaps is covered with tamarisks, and the remainder is almost all that can be said to produce reeds; for on the clear waste land that is high, and which amounts to 202 square miles, the grass although long and harsh, can scarcely be called reeds, nor do the gramineous plants in the forests (bamboos excepted) arise to that stature. On the islands and low banks of the Ganges, the most common reed seems to be the same with the Kasiya, or Kas of the

Bhagalpur list. The leaves at Patna are called Jhalasi, and are used as thatch, although very bad. The stem is called Kharai, and the upper part, which supports the flowers, is called Muj, and is used for making ropes; but it is not of the best quality. The young leaves are considered as good fodder. The coarse grass most common in the higher lands is the Khatra of the Bhagalpur list, and is that most commonly used for thatch. Its sweet smelling root is here called Khaskhas. The long grass in the woods that is of most use, is the Sabe of the Bhagalpur list, the collecting of which on the southern frontier gives employment to a few people, but the supply from thence is quite inadequate to the demand, and great quantities are imported from Ramgar. In hedges and on the sides of sugar-cane plantations, several other reeds are reared, and these might readily be extended, so as amply to supply the demand without running the smallest danger of harbouring destructive animals. The kinds reared in the hedges, so far as I observed, are similar to those cultivated in Bhagalpur. The wild plants used in the diet of the natives, as must be the case wherever the country is tolerably cultivated, are of very trifling importance. In most years the Mahuya flowers in the wilder parts of the country, are used as a part of the food of the lower classes; and in years of famine the stoppage of the distillery might produce some alleviation of the evil.

In times of scarcity the poor derive some assistance from collecting the mango stones, and by extracting the kernels, which they bruise in a mortar and form the powder into cakes. Wild plants of a succulent nature are very seldom used in curries by the poor of these districts. Leafy plants that grow spontaneously are rather more used, chiefly the Kalmi or *Convolvulus repens*; Bathuya, a small *Chenopodium*; Gendhari, an *Amaranthus*, and Guma, a *Phlomis*. The poor, indeed, seldom use vegetables cultivated for the table; but they are allowed to collect young plants of mustard, pulse, or the like, which are always sown too thick, and cost them nothing. The only

wild acid seasoning, which costs the poor nothing but the trouble of collecting, is the Jhar-Bayer. All the others are here saleable, and the trees are private property and are planted. The wild fruits that are eaten raw, are only Baingcha and Kend; the others are all saleable, and the trees are considered as private property and are planted. There are no wild aquatic plants used in diet: great quantities of the Singghara are indeed reared, but it is regularly cultivated, and almost every pond or piece of water that retains water throughout the year, is applied to rear this plant.

I have made very considerable progress in ascertaining the plants of this country that are used in medicine, but as the number is exceedingly great, and as all I can say on the subject must be confined to disquisitions strictly scientific, and totally uninteresting and unintelligible except to the physician and botanist, I shall not here detail any of the information that I have procured. I can, however, recommend the subject as highly deserving the attention of government, as well as of men of science. From the state in which the European practitioners of medicine are here placed, no very great discoveries can be expected, although some useful practices of the native physicians, by mere chance as it were, have been brought into notice. It appears to me, however, probable that, among an enormous farrago of useless drugs, they possess several of very considerable powers, and that in many cases they apply them with skill. I am farther persuaded that with a very little assistance from Government, these useful practices might soon be brought to light, which never, I suspect, will be done by translating their books, owing to the terrible confusion and uncertainty that prevails both in their pharmaceutical and nosological nomenclature. What is wanted is a native physician to prescribe and a European to give an account of the symptoms of the diseases and of the effects of the practice. Such substances as have been actually employed, where the practice seems to have been successful, are then to be carefully ascertained. If they are the produce of the vicinity, this may be

done by sending them to the botanical garden for investigation, or if they have come from a distance by accurately describing them and endeavouring to trace them to the country where they are produced, a labour which ought, of course, to fall entirely on the Superintendent of the Botanical Garden. I should therefore propose that a skilful native physician should be employed under the superintending surgeon at the Presidency, who in the different native hospitals under his inspection should point out patients proper for the physician's management, and who should direct the surgeons, under whose care the patients may be, to take a careful account of all the proceedings of the native physician and of the symptoms of the diseases that he treated, which accounts, together with specimens of the drugs employed, should be transmitted to the medical board, and this should make an annual report on what had been observed, and publish, for general benefit, any useful discoveries that may be made. The expense of a salary to the native physician, and of the drugs, with perhaps a clerk to make a fair copy of the cases, seem to me all that could reasonably be charged, and should not exceed 100 R. a month. There are indeed three chief sects of native physicians, the Yunani (Ionians), among the Muhammedans, the Sakadwipi Brahmans in Behar, and the Baidyas in Bengal. Even if one of each of these was employed, which might be satisfactory, each treating different patients in his own manner, the expense would be altogether trifling. More effectual means might no doubt be proposed for bringing to light the medical science of the natives, but they would be attended with some considerable expense, as a young surgeon, who should dedicate his time to the study of the languages and science of the natives, must relinquish his other views and would require a considerable allowance.

There are scarcely any wild plants employed for various purposes but such as have already been mentioned.

CHAPTER III.

OF THE MINERALS

The minerals of these districts may be divided into three remarkable clusters of hills, with some sporadic matter in the plains, and shall be described in that order.

Section I. Of the minerals in the Southern range of Hills.

By far the greatest part of the rocks of Behar, for there are none in Patna, is of exactly the same nature with the great component part of the western division of Bhagalpur, that is, consists of quartz, or of jasper, or of the horn-stone of the later mineralogists, and these running so into each other, that it is often impossible to say to which the rock has the strongest resemblance. The hills composed of these materials have a most arid and sterile appearance; but, in general, very inferior in grandeur to those of granite. The latter rise into peaks of the most magnificent boldness, and they are better wooded; their crevices being more favourable to vegetation, although the siliceous hills give rise to more springs of water and perennial rivulets. In the recesses worn out by these, there are often abrupt precipices and scenery of great magnificence, although the most striking feature of these siliceous hills is sterility. The hill west from Gidhaur, in the Bhagalpur district, is of this nature, and extends into this district, where similar materials bound on the south all the division of Sheykpurah, and a considerable part of Nawada. The eastern end of these hills consists more entirely of the quartzose stones than the west, in which granite stones are more prevalent; and this induces me to suppose, as the eastern end is much further north than the western, and as the particular hills run mostly east and west, that these hills, which form the southern boundary of Behar,

may belong to two distinct mineral arrangements; the one towards the north and east being connected with the Mungger range of hills, while the other may be connected with hills of a different description, extending into the Ramgar district; but I have only had an opportunity of a partial view of their northern side, and shall not therefore form divisions for which there may be no foundation.

So far as I know, the hills extending immediately west from Gidhaur into the Sheykhpurah division, and giving rise to the Dhuruya, Bahuyara, Som, Uruya, and Dhund rivers, consist entirely of quartz, of jasper, and of the hornstone of the later mineralogists, but I had only opportunities of examining a few parts. The next range towards the sand west, the most prominent part of which is named Siyur, seems more varied, and especially the small hills on its south side, which have a more rugged granitic appearance than the great mass of the hill. The western end of this, which is named Denuya, consists entirely of quartz, most pure and glassy at the bottom, and more mealy and intermixed with ferruginous and other heterogeneous substances towards the summit. The small hill again in Harkharghat, at the middle of this range, is a granitel of much black micaceous matter, intermixed with a little white quartz, which in many places forms little lines somewhat like the Egyptian granite that I have seen; and this would no doubt be a very ornamental stone, should large entire blocks be procurable; but without much labour that could not be ascertained, and the specimens, that I procured, were rifty. The small hill Sumba, north from Harkharghat, consists of schistose mica, composed of reddish quartz and silvery mica. Basai, the small hill next to Sumba on the west, consists of a jasper, variegated red and white, and the surface in some places covered with irregular crystals of white quartz.

The low continuation of Siyur, which extends between the Sakri and Khuri rivers, and is called Kalana, consists of granular quartz or hornstone, which towards the bottom of the hill is red, and

towards the top white. The continuation of the same hill beyond the Khuri, which is called Sherpur, consists of large grains of fat quartz, forming an aggregate intermixed with dark dots. The whole of the centre of this ridge may therefore be considered as consisting of quartzose rock; but I have already said, that the little detached hills on its north side are composed of other materials, and the same is the case with those towards the south. Near the above-mentioned Kalana hill, on its south side, are two hummocks called Dhakni. The smaller of these consists of schistose mica, as does also the fine little hill called Purni, which is some way south from it, and from its summit affords one of the finest views which I have seen in the course of this survey. This schistose mica, consisting of white quartz and silver mica, runs south-west and north-east, with an inclination to the north-west. The larger hummock of Dhakni seems quite sporadic, and consists of earth containing large masses two or three feet in diameter, of a fine blackish hornblende, with numerous small crystallizations immersed, and promises to be a stone well fitted for ornamental building. It is exceedingly heavy. This hill in its structure resembles that of Paingti, near Bhagalpur, where masses of the hornblende are scattered among earth, no doubt arising from parts of the rock that have decayed. In the whole of this district I have seen nothing similar. In no parts of this range of hills have I found any other pure hornblende in mass; but it enters largely into many of the aggregate stones, especially the granitels, one of which has been already mentioned.

The great hill called Mahabhar, which lies south from the last mentioned range, where I examined it on its northern face, consists of a granular aggregate of glassy white and red quartz, which is fine grained towards the bottom, in the channel of the Sakri or Manggura, where it is splitting into vertical plates running east and west; but towards the upper parts of the hill it is larger grained, and quite free from a schistose structure.

Somewhere in this vicinity is, I have no doubt, a place, where small fragments of a rock crystal called Phatik are procured; but for some reason, that I could not discover, the owners were alarmed, and would not allow me to see it, although the value of the crystal must be quite a trifle; but they are poor ignorant timid creatures, although they assume the title of anointed (Tikayit), and of warlike descendants of the sun (Suryabangsi Rajputs). A Muhammedan trader of Ekbarpur, who had previously shown me some mines of mica, offered to conduct me to the place, and in the evening showed me the two small hills of Ektira as at the spot; but in the morning the Tikayits having joined us, he took me much farther west, to where the Sakri or Manggura issues from Mahabhar, and on the banks of the river showed me as the mine a piece of naked stiff red clay containing many stones and fragments of rock. On the surface there were no doubt to be found scattered bits of rock-crystal, both crystallized and without regular form, as well as some opaque siliceous nodules, much resembling some of those found on the Rajmahal hills, which I have compared to indurated Khari or Bole; but there was no appearance that the crystal had ever been collected by digging a mine, and I have no doubt, that such a mine exists; but neither the trader nor Tikayits could by any means be induced to show it either to me, or to two men, whom I left to search for it.

In the whole cluster of hills and hilly country south and east from Ragauli or Salabutgunj, granitic rocks, and mines of mica, are the most conspicuous features. The little hill called Lohangr-rishi, with the two adjacent hummocks, are fine grey granite, as are two peaks immediately south from Salabutgunj. The great mountain of Durbasa-rishi consists also of granite; but it is smaller grained, and its felspar is red. In some places of this rock the quantity of quartz, in others that of the felspar predominates. As I found the same stone in the channel of the Dhanarje between Durbasa and Sringgi-rishi, I

have little doubt, that the latter consists of the same materials, although I did not actually visit the hill. The granite of Durbasa is perfectly entire, without any appearance of fissure; but some of that in the channel of the Dhanarje, owing merely to the action of the water, is dividing into thin vertical plates, that run east and west. The redder granite of Durbasa is an exceedingly ornamental stone. I had no opportunity of approaching the hill called Gautama, nor those immediately adjacent; but their appearance from a distance is that of pure granite; and Gurba, which terminates the range towards the west, is a vast mass of very fine large grained grey granite that would be highly ornamental in building. The whole of this exterior range lying between Mahabhar and Lohabar in the Ramgar district, immediately west from Gurba and adjoining the plains of Sahebgunj and Nawada, may be considered as pure granite; but the country south and east from it, which contains the mines of mica, although granite, is of a very different structure, which I shall now explain.

As I knew that an agent of the commercial resident at Patna had procured a considerable quantity of mica from the hills near Rajauli, it was impossible for the Tikayits and native traders to conceal the place altogether from me; but every means was taken to give me imperfect information on the subject. The mines where this substance is dug are partly situated on the Belan, and partly on the two branches of the Dhanarje river. The latter, being the nearest and most important, were at first altogether concealed, and I was sent to the Belan, in hopes that the difficulties of the road would prevent me from proceeding. In fact I could only see one of the mines on that river, and it was by mere chance that there I met with a Muhammedan trader from Ekbarpur, who said that he had been ruined by making advances, which the Tikayit, or chief, would not assist him to recover, and who was therefore discontented. He took me to two of the mines on the banks of the Dhanarje, and gave me an account of the circumstances; for nothing could induce any of the workmen to

approach. The reason assigned was, that the agent of the commercial resident had beaten them severely; but this I presume was not true. I have indeed no doubt that they had been alarmed by the traders or owners of the mines, who probably told them that I would beat and squeeze money from them; and they being poor ignorant creatures, who knew nothing of Europeans, would naturally enough believe the story. Both traders and owners were evidently alarmed at any interference in their operations, and no doubt thought that I had come on the part of the Resident to settle a regular trade. The situation of the mines (khans), so far as I could learn, is given in the map of the hills of the Nawada division; but I visited only Dharpai, Chirkundi, and Bandarchuya. From a view of these, however, I am convinced that the whole resemble each other. All the part of the country in which they are situated, so far as I saw or could learn, consists of little hills, close huddled together, and separated in some places only by narrow winding vallies. In the map it was impossible to trace these, without having traversed them in all directions, which would have been extremely difficult, both from the badness of the roads and the want of guides, as the only answer I could procure from those to whom I applied was, that they knew of no roads but paths, practicable only for people on foot, and the distances did not admit of that manner of investigation farther than I proceeded. The ascent to Dharpai and Bandarchuya is very considerable; and all the lower parts of the hills in which these mines are consist of gneiss, according to Gmelin's definition of that term. The gneiss of Dharpai consists of black micaceous matter, intermixed with more or less white quartz; but in most places the micaceous matter prevails, and is often so heavy, that I suspect it to be an iron ore, while in other parts it is perhaps hornblende. All the specimens which I procured were full of rents. If entire masses could be procured, they would be an ornamental material for building. In some detached masses the quartz has been entirely changed or destroyed, and what remains would

appear to have become an iron ore, but I saw no rock of this nature. In other places again the quartz is the most predominant matter, and, with some of the black micaceous matter and small garnets, forms a triple aggregate. That near the surface is too much decayed to admit of a fine polish; but by digging, more entire might probably be found. Some of the quartz in this stone is glassy, some is white.

The upper part of both hills consists of rocks of fat white or pellucid quartz and of white felspar, some of which is very beautiful. The mica runs through these matters in veins or nests, just as it usually does in granite, only that the masses are much larger; and the summits of these hills may be considered as a kind of that substance, the component parts of which are rocks in place of grains. In some parts, indeed, the rock adjacent to the mica consists of large grains of quartz and felspar intermixed. The mica of Dharpai (abarak of Hindi dialect), as well as of the adjacent mines, although, when split thin, it is perfectly pellucid, when in thick masses, has always a brownish cast, owing apparently to an ochraceous matter, that is always more or less intermixed in the veins. The mica of this mine has been wrought in a line, running along the face of the hill from east to west, about 200 yards in length, but interrupted in the middle by a water-course. It winds very irregularly; but no where, that I saw, comes to the surface, all that came in view having probably been removed. In some places it has been removed from little trenches; in others perpendicular shafts have been dug, from six to twelve feet deep, and from these galleries have been formed, for a short way, into the veins of mica, which seem no where to be above two to three feet wide. The pieces of mica are so wedged into these narrow places, that in forcing them out with an iron crow, they are usually much broken. Accidents would seem to be frequent, which is not attributed to the want of skill in the workmen, but to the anger of the gods. A stone-cutter who was in my service, a Hindu of pure birth, was going into one of the shafts, in

order to break off a specimen, when the guide, a Muhammedan trader acquainted with the usual fears of the workmen, pulled him back in alarm, and said, "Pull off your shoes—will you profane the abode of the gods?"

The mine at Bandarchuya is more considerable, and is situated at the summit of a long and steep ascent. The rock all the way up until near the mine, is exceedingly rotten; but consists of the gneiss, usually called schistose-mica. Towards the summit the rock is either quartz, partly white, partly glassy, or the most beautiful white felspar, or both intermixed. In some places it is quite free from mica, in others it has small masses intermixed. The veins or beds of mica, in several places that have not yet been wrought, come to the surface, and show that it is disposed in various masses impacted together, not parallel, but forming angles with each other. Each mass is composed of numerous parallel layers, the united thickness of which is always less than the breadth or length of the plates. The veins here are larger and nearer the surface than at Dharpai, so that there has been no occasion to form shafts and galleries, the whole has been extracted from trenches, some of which however are now very deep, and so choked with rubbish, none of which is ever removed, that they are wrought with much difficulty. The workmen descend into the trenches by means of single bamboos, the branches of which cut short serve as a kind of ladder. This will serve as a sufficient proof of their want of invention, as the descent is exceedingly dangerous, and every material for proper ladders is growing close to the edge of the trenches.

The mine of Chirkundi is less considerable than the others, and is situated on a low hummock, which consists entirely of fine fat quartz, containing some black dots. The hill being no more than 100 feet high, we have only quartz, although I have no doubt that below the surface of the plain it rests on gneiss. The workmen having forced out the masses of mica with iron crows, remove all loose leaves, and then cut the masses round, or into

parallelograms, according to their size; but by far the greater part of the pieces are small. The largest pieces are two cubits long and one broad, and are valued to the miners at 8 rupees a man (48 s. w. a ser, 52 sers a man), or 64 lb. Such are seldom seen. The second size consists of pieces one cubit square, and is sold by the miners at 4 rupees a man. The third sort is half a cubit long and broad, is sold by the bundle, weighing about 15 sers, but comes to about 2 rupees a man. The fourth size is about four inches in diameter, and sells at 15 bundles, or rather more than a man for the rupee. The chips and leaves removed in cleaning the pieces sell by a heap, of 7 or 8 mans, for a rupee. It is used for preparing a red powder thrown about at the festival, called Holi, and for painting walls and earthen ware. These prices are given by the traders at the mine, and must be much enhanced by the carriage, which, until it reaches the plain, must be on men's heads; the market is Patna, to which from Rajauli it is carried on oxen. The miners are usually paid in salt, grain, and cloth, mostly given in advance. The miners are all of the aboriginal tribes, Bhuinghars, Mushars, and Rajwars. Each man pays 2 rupees a year to the Zemindar, and may clear from 20 to 50 rupees a year, according to his luck, for a good deal depends on the vein containing larger or smaller pieces; but about 35 rupees may be considered as the average gain of each man. The miners work 10 months in the year at this employment. The remainder is spent at marriages, and in cultivating a few fields sown with coarse grains and pulse. Ten or twelve usually work together, under some man who is supposed to have skill sufficient to counteract the cunning of the trader: but in this, I believe, he is very seldom successful, unless the trader quarrels with the owner of the mine, in which case the miner will do no work, and will repay nothing that has been advanced; for he has all the disposition in the world to be a rogue, and knows of no other authority but that of this anointed lord, the Tikayit.

The whole mines in Behar belong to two of these descendants of the sun. Buniyad Singha, of Pangchrukhi, possesses:—1. Dharpai, with 30 miners; 2. Dharkhari, 10; 3. Dangrhi, 15; 4. Bheloya, 20; 5. Sapi, 10:—85. Brajamohan Singha, of Dubaur, possesses:—1. Danggarkati, with 15 men; 2. Bandarchuya, 100; 3. Barhariya, 10; 4. Jhakrahi, 20:—145. 5. Chirkundi, not wrought last year.

These 230 men, at the above rate, should turn out mica to the value of 7,000 rupees. There are also many mines of this substance in the adjacent parts of the Rangar district, so that the whole quantity should be great: but at Patna, where almost the whole is sent, the traders acknowledge only an import of 500 mans, worth 2000 r. which at the mine would not cost above 1000 r.; and at Nawada was called only 500 r. Such discordances it is impossible to reconcile. The places which I saw had every appearance of being frequented by the number of people stated as above by the trader of Ekbarpur, and he was perfectly acquainted with the subject; but he was a man on whose veracity no dependence could be placed, although I do not know any reason that he could have had to magnify the quantity procured. The quantity stated at Patna seems too small for the consumption of Bengal, where the amount used in pageantry, both by Moslems and Hindus, at holidays and marriages, is very great. I therefore suspect that the traders of Rajauli send much direct to Calcutta or Moorshedabad by the way of Virbhumi.

On the north side of the range of mountains now described granite was traced in several parts but whether or not connected with the hills of Rajauli, I cannot take upon myself to say. If it is, the jasper of Gidhaur, Siyur, and Mahabhar, would appear to have been wedged in between the granite range of Rajauli, which probably extends far east, and this granite of which I am now treating. It runs between the hills of the southern frontier and those of Rajagriha; but never rises into any thing like mountains, although in some places

it forms small detached peaks. The farthest west that I observed this granite was in the channel of the Dadur, at Futehpur, where it consists of white quartz and felspar, with silvery mica, and is quite below the surface except where laid bare by the river. This is about six miles north from Gurba, the western extremity of the granitic ridge of Rajauli. I next saw this granite at Sitamarai, where it forms a very low ridge, or rather an eminence covered with great rugged masses, in one of which has been dug a hermitage, that has been described in the topography. These masses are of a very fine solid grey granite. Finally, this granitic stratum, if it may be so called, extends to the Kiyul, and there rises into many small peaks of a singular nature, which, I regret, were not sufficiently examined, many of the rocks having there a very anomalous appearance. This, I am inclined to suspect, is owing to their having undergone the action of fire; or if it be contended that all granite has done so, that these have been cooled under circumstances different from those that have usually occurred.

Jaynagar, the furthest north of these small hills on the Kiyul, consists of a very solid rock entirely resembling the hard mass of the quarry of millstone near Labeta, described in the account of Bhagalpur, and composed of small masses of fat quartz, united by a greyish powdery substance, in some places tinged red. This powdery matter does not admit of a polish. Various detached masses scattered on the surface of the hill, more or less tinged red, and some of them slaggy, while others of them retain the felspar entire, induce me to think that the whole has been a granite which has undergone an imperfect fusion, so that the quartz remained unchanged, while the other ingredients were in a great measure altered. Some of these fragments bear a striking resemblance to the siliceous concretes that are incumbent on the Khari at Patharghatta and at Kharipatar in the Bhagalpur district.. Among these detached fragments on Jaynagar are many of whitish siliceous hornstone; and the rock is intersected by narrow

veins of quartz, running in various directions to a considerable distance.

The hill of Satsanda south from Jaynagar contains two granites, both tolerably perfect, although they have somewhat of an uncommon appearance. Both are of moderate sized grains; the one is grey, consisting of white felspar and quartz, with much black granular micaceous matter; the other consists of yellowish felspar, glassy quartz, and a little black micaceous matter. What I procured is rather decayed; but if there are sound masses, the stone would probably be highly ornamental, as even the decayed parts look well when polished. On the small hill Mayhuya, east from Satsanda, there is a rock of bleached granite of a very strange anomalous appearance, consisting of white felspar, glassy quartz, and black micaceous matter; the first and last of these ingredients are very much changed from their usual form. At Nabinagar, a small hill east from Majhuya, is also a gneiss, which has an anomalous appearance, its materials being very powdery. At Tek, one of the largest of these small hills, there are two granites, both of an uncommon appearance. Both are grey, and their felspar and micaceous matter has become powdery; but the white matter in the one and the micaceous black matter in the other are the predominant materials. The former admits of a good polish, but the latter does not. On the bottom of Tek are masses of a strange kind of glassy quartz, intermixed with brownish matter. I do not know whether this forms a rock or is in mere detached masses. On Dhanawa, south from the four last-mentioned hills, is a strange kind of siliceous hornstone, whitish, livid, and red. Some of it is evidently a slag, while in other portions some remains of the rhombs of felspar may, I think, be traced. On the whole, perhaps, it would appear that these hills are a continuation of the granitic ridge which passes by Futehpur and Sitanarai, and has been changed by the action of fire.

Section 11. Of the Minerals in the Hills of Rajagriha, &c.

I now proceed to treat of the next great cluster of the minerals belonging to this district, which commences, so far as I could trace it, between the Nilajan and Mohane, opposite to Buddha-Gaya, and extends in various interrupted chains of hills to a considerable way past Sheykhpurah, running about south-west by west and north-east by east, but not in a straight line, as it forms a curve with the convexity towards the north. This cluster is about 60 miles in length, but there are many interruptions, especially between Giriyak and Sheykhpurah, where there is a level space of about 18 miles, in which the rock, so far as I know, appears only at Behar. That, indeed, is a little north from the line of other hills; but, being exactly of the same nature, no doubt belongs to this cluster. The general breadth of this is about 9 or 10 miles, divided into various ridges running pretty nearly parallel with each other, and separated in many places by fine arable land. The most compact part consists of two long ridges nearly adjoining, and called the Rajagriha hills, from whence the whole may be named. This cluster, except along its northern face, consists almost entirely of quartz, siliceous hornstone, or jasper, with very few extraneous matters, and abounds in hot springs. Along the northern face there is a greater mixture. I shall therefore first describe the more perfect part, and then the changes which it has undergone on the northern face.

The end of this cluster, towards the south-west near Buddha Gaya, consists of rude jasper red and white, which rises just above the surface between the Nilajan and Mohane rivers. The hill north-east from thence, called Dhonggara, at its north end consists of a white siliceous stone with a fracture intermediate between that of flint and that of quartz, and stained of a dirty red in irregular specks. A small hill west from this is arid white

quartz, while Parwariya, north-east from that small hill, is white jasper with red stains. The hill north-east from that consists of white quartz, rather mealy, with a few black specks. The next hill to this, towards the north-east is of quartz or jasper with red stains; and the same continues on the hill beyond the Pengwar called Bhengras. On this has been dug a small quantity of an imperfect Khari or indurated clay, but to so small an extent, and of so bad a quality, that it is not worth attention, farther than as showing one of the ingredient parts of these hills. In the chain parallel to this towards the north-east, between the large hill called Maher and the small hill called Telsanda, the loose stones, for I saw no rock, are of white rude jasper with red stains; while the other extremity of the same ridge called Sobhanath is an aggregate rock of glassy and mealy quartz with red and black specks.

The hill called Uruya, which forms the south-west extremity of the Rajagriha cluster is an exceedingly bare rock of a granular jasper, which is sometimes prettily variegated white, grey and red, and takes a good polish, so as to be highly ornamental. The small hill named Karwa, north-west from thence, consists of a red jasper with veins of white quartz, which also promises to be an ornamental stone, although the red parts do not admit of a perfect polish; but that is probably owing to the specimen having been taken from the surface. Adhering to its surface I found a mass of irregular crystals of a very bright white, having a lustre somewhat between that of quartz and felspar. The hill at Narhat, the N.W. corner of the Rajagriha cluster, is also siliceous. At Jharnaghat on this northern branch of the Rajagriha hills the rock is grey siliceous hornstone, in some places stained red.

A little farther east than Jharnaghat, but on the southern ridge of the Rajagriha hills at Tapoban, the hill consists of quartz and hornstone, and a great deal of the latter, especially that near the hot springs, is red; but the rock does not reach to where these issue from the earth, nor did

I observe any stone within several yards of the pools in which the water is, and which I shall now describe. At Tapoban there are five pools considered holy. They are situated in a line parallel to the hill at its foot, and the ground on the plain near them is spouty and wet. Whether or not in a state of nature there were an equal number of springs that came to the surface, I cannot say; but at present the springs are at the bottom of small artificial pools 10 or 12 feet deep. The line of pools may extend about 150 yards, and the quantity of water that issues from each by a lateral passage, is very inconsiderable. On the evening of the 14th of January, the thermometer being at 70° in the air, rose in the easternmost pool to 116° ; in the next it stood at the temperature of the air; in the third pool the thermometer rose to 100° in the fourth to 102° and in the fifth to 112° . Except in the last no air bubbles rose from the bottom of these pools, and even in the one farthest west, the number and size of the air bubbles was very inconsiderable, when compared with those which issue from the fine warm springs of the Bhagalpur district. As no person resides in the immediate vicinity of these springs, and as they are visited by the priests only once a year, I cannot say whether or not they undergo periodical changes. The heat being so moderate, the pilgrims bathe in them; and, as the annual assembly had been held the day before my arrival, the water was in a beastly state of filth; but at other seasons it is probably clear enough. It must be observed, that the two middle hot springs, where the thermometer stood at 100° and at 102° contained several small fishes, and many frogs; but that none were to be seen in the two extreme pools, where the heat was 112° and 116° ; so that the heat, at which these animals can cease to live conveniently, is somewhere between 102° and 112° of Fahrenheit's scale.

About three miles east and north from Tapoban, in the same ridge of the Rajagriha hills, there is a recess in the face of the hill, narrow at the bottom, and widening gradually upwards like

a funnel; and the view of it has been opened to the plain by the southern side having fallen. Whether or not this has been the crater of a volcano, I cannot take upon myself to say. There is no peak at the place; the cavity is in the side of a long ridge, the top of which is nearly horizontal, and the cavity reaches from the summit to the bottom of the ridge. There is however no appearance of its having been formed by the action of a torrent. About three miles farther in the same direction, and in the same ridge of the Rajagriha hills, at a place called Hangriyo, a very peculiar substance called Silajit exudes, and I shall now describe the appearances. The place from whence this issues, is about half way up the ridge, which is exceedingly steep and rugged, and is covered with fragments of quartz and hornstone. Having scrambled over these with much difficulty, I came to the foot of a great rock, in which there was a cave. Immediately below this was a mass consisting of small fragments of quartz or hornstone, imbedded in a white harsh indurated clay like some of the Kharis described in Bhagalpur. The cave has a wide mouth, and may be 50 or 60 feet in diameter, and 10 or 12 feet high, where most lofty. The floor rises inwards with a very steep ascent; and the cave has no doubt been formed by large masses of the rock having decayed, or having been changed into the imperfect Khari above mentioned, and having then tumbled down the slope. The roof looks very threatening, and in its crevices shelters wild pigeons; while the cave is said to be an usual haunt of bears and tigers. It is perfectly dry, and near the mouth is cool and airy, but at its further side an aperture, 12 feet wide and four or five high, leads into another smaller cave, the heat and stench in which was so great, that I merely looked in, to satisfy myself that there was no farther opening. On approaching the mouth of this, on a cold morning in January, I was instantly thrown into a most profuse perspiration; but unfortunately I had not heard of any such circumstance, and I had no thermometer with me. The heat I have no doubt

is subterraneous, the stench appeared to me to proceed from bats. I did not see any, but thought I heard them chattering among the crevices of the rock. The rock, in which the cave is, consists of a greyish siliceous hornstone, in some places stained red. The rock of imperfect Khari lying under this cave, and which has evidently fallen from it, confirms strongly the opinion mentioned in the Bhagalpur papers, of Khari owing its change from siliceous rock to the action of heat.

Looking up from before the cave, I saw, about 30 feet above my head, the silajit besmearing the face of the rock, and proceeding from the edge of a small ledge, in which, I am told, it issues from a crevice in the hornstone. It was impossible for me to inspect the place, which is only visited by one old man of the Musahar tribe. Before venturing on the peril, he fortified himself with some spirituous liquor, having previously made a libation to the ghosts (vira) of the vicinity. An active young man in my service attempted to follow him. Going along the foot of the rock, they found a projecting ledge, along which, supporting themselves by the roots of trees, they advanced, until they had reached about 40 or 50 feet above the place from whence the silajit exudes. Here the young man's heart failed, while the old Musahar descended the naked rock by little crevices and projections with which he was well acquainted, and, having collected as much of the silajit as he could scrape from the rock in a leaf, he returned by the same way. A very moderate ladder, placed where I stood, would have saved all this danger; but the old Musahar perhaps considered that such a means of facilitating the route might interfere with his gain. I was told that the old man generally ascends three times a month during Paush and Magh, and visits as often another place about a quarter of a mile farther east, which I did not see. He says, that in the season he does not collect above two pounds weight, and perhaps gives no more to the owner, Ray Khosal Singha of Patna, who sends it in presents, as it is considered a valuable medicine.

When fresh from the rock, silajit is of a dirty earth colour, and is always mixed with impurities, that crumble into it from the precipice above. It is then about the consistence of new honey, and has a strong rather disagreeable smell, although it cannot be called very offensive. When kept in a bottle with a glass stopper for some months, it acquires a deeper brown colour, and becomes thicker; and, exposed to the air, it may soon be made into pills. It seems to be very different from a substance which, in Nepal, is called by the same name. I am now convinced that the differences which I noticed in the Silajit from Nepal arose from the specimens that I saw in that country having been long kept. I have since procured some that perfectly retained the peculiar odour of this substance. From the hot springs in the vicinity, and the heat of the cave below, I suspect that it exudes from the action of subterraneous fire. The natives pretend that monkies eat it, and attribute the small quantity procured to their depredations; but I think that the circumstance is doubtful, and have no doubt that, with care and a ladder, several pounds might be procured, should it be found useful: but it owes its celebrity among the natives to its being supposed to possess the imaginary quality of an aphrodisiac. When placed on burning charcoal, it swells a little and smokes, and when heated red, is reduced to white ashes without emitting flame. It cannot, I presume, therefore be considered as a bituminous or inflammable substance, the only class of minerals to which it has any resemblance.

On the ridge oposite to Hangriyo, and adjacent to the ancient residence of the kings of India, from whence these hills derive the name of Rajagriha, are two clusters of hot springs, the buildings about which have been amply described in the topography. I shall here confine myself to an account of them as natural productions, premising that the buildings which have been erected very much impede the accuracy of observation. I suspect that those near Brahmakunda have, in a state of nature, been one spring, which has been sub-

divided, and conveyed by various channels, so as to supply the various pools and spouts from whence it now issues; and in this manner I account for the different degrees of heat observable and for several of the spouts that formerly flowed being now dry. In Brahmakunda, where the water is collected in a pool, in which the people bathe, the water is dirty, but free from frogs. On the 19th of January, the thermometer in the air being at 62° , it rose in the water to 109° . The water from all the spouts is perfectly clear. In that called Kasi the thermometer stood at 107° , in Langga at 104° , in Pangchanan at 94° . These are lower down than Brahmakunda, and probably more remote from the common source. Among the seven spouts above Brahmakunda, Gautama and Bharadwaja raised the thermometer to 104° , Viswamitra to 100° , and Yamadagni to 102° . At the spout called Vyas, which is the highest, the thermometer rose to 110° . The whole water of these springs, when united below the sacred places, seems to be nearly as copious as the stream from Sitakunda, near Mungger. At the bottom of the hill from whence these springs issue there is a small cool spring. Brahmakunda is situated about 100 feet from the bottom of the hill called Baibhargiri, at its eastern extremity. The rock immediately above the hot springs is a reddish jasper with white veins; but on the same hill, about three-quarters of a mile N.W. from thence, the cave Soubhandar, described in the topography, has been dug into a rock, of what in the account of Bhagalpur I have called imperfect khari, which is evidently a jasper changing into indurated clay, but not yet arrived at that state. In its colours it entirely resembles the jasper that is adjacent, being variegated red and grey, in veins, layers, and blotches. At the bottom of the adjacent hill Bipulachal are five sacred pools, also described in the topography. Four of them are in one cluster, at the west end of the hill, but on the level. The water in Suryakunda raises the thermometer to 103° , in Santanukunda to 106° , and in Som and Ganes-kundas to 102° . Suryakunda swarms with frogs, which therefore like a heat of

103°; but they shun Brahmakunda, where the heat is 109°. The remaining pool, Sringgirishi is situated at the foot of the hill, about a quarter of a mile east from the others, and its heat is only 97°. The water in all these pools, owing to people bathing in them, is exceedingly dirty.

The lower part of Bipulachal, contiguous to these springs, consists of very small grained hornstone of a grey colour, with veins of white quartz. Above the springs, at a very considerable distance up the hill, is a mine or quarry of crystal (phatik). After ascending some way, the rock becomes more granular, is in some places stained red, and in others contains rounded nodules of quartz; and the surface of fissures, and little cavities, are covered with minute crystals. The quartz in the veins of this stone is white and opaque, but has rather an anomalous appearance. The rock, in which the mine is immediately situated, is a kind of crumbling sandstone, surrounded, however, on all sides by the siliceous rock, and divided like it into trapezoidal masses. Some of these masses are white, some ferruginous inclining to red. Among these blocks the workmen have found interstices, from two to four feet in width, and winding in various directions. These interstices are filled with small angular fragments of quartz, generally semi-diaphanous, but stained externally red, and intermixed with a red ferruginous harsh earth. On the spot I was not informed, that this earth was applied to any use; but at Patna I was shown a substance, called Gabis, which seems to be the same, and it is said to come from Rajagriha. It is made up in balls, which are used both in medicine, and as a pigment applied to potters' ware, before that is burned. At Patna it sells at from $1\frac{1}{4}$ to $1\frac{1}{2}$ man (76 s.w. a ser) or from about 93 to 110 lbs. a rupee. The quantity said to be brought is so considerable, that although it is a substance similar, and of the same origin with the red earth of the crystal mines, it is probably found in large masses somewhere about the foot of the hill.

The workmen dig out this gravel and earth, and follow its veins 20 or 30 feet into the rock. The

dealers in crystal then pick it out from among the gravel, where it is always found in single detached crystals, never adhering either to one another, nor to the stony matter, by which they are surrounded. No large ones have ever been discovered, their size never exceeding that which will make small beads. They consist of an hexagonal prism, terminated by hexagonal pyramids, but the form is seldom perfect. They are seldom thoroughly pellucid, but have somewhat of a smoke colour. This mine has not been long wrought, and 10 or 12 excavations have been made. Crystal was formerly procured from a place lower down the hill, near a temple of Ganes; but since the discovery of the mine just now described, that has been abandoned. I understand, that crystal is also procured at a place called Chakra, north from Saphighat, which is seven or eight miles south-west from Rajagriha, and near Tapoban on the opposite side of the hills. It must be also observed, that the upper part of Ranachal, the hill immediately adjoining to Bipulachal, consists of a sandstone similar to that in which the crystal is found; while the lower part is a red and white jasper, that will be highly ornamental, if it takes a polish. The east end of the same hill, which is called Giriyak, and on which the ruins attributed to Jarasandha are situated, consists of white, grey, and red granular quartz.

Between Giriyak and Sheykhpurah there is, as I have said, a very large opening, in which I observed no stone, except on the hill of Behar, and that is considerably north from the line; but it consists of exactly the same materials with both clusters of hills, being a granular siliceous hornstone, in most places grey, but in some places stained red. The hill is composed of parallel layers, rising from the east towards the west at an angle of about 20° with the horizon. These layers are from six inches to two feet thick, so that the rock might be considered as composed of horizontal strata. To me it appears, that these layers have been occasioned by cooling, desiccation, or decay, and that the layers have not been formed by various successive depositions. The rock is also,

as usual, intersected by two kinds of vertical fissures, crossing each other at nearly right angles. Those running east and west are very wide, often several feet, owing apparently to the action of rain running down the declivity of the hill; while those running north and south are mere fissures. This as I have said, is certainly a rock, which has much the appearance of one composed of horizontal strata; but all rocks of quartz, siliceous hornstone, or jasper, that I have seen, have more or less of a similar appearance, owing to their breaking into trapezoidal or cuboidal masses. The hills of Sheykhpurah are exceedingly rugged and sterile, and entirely resemble in structure those of Rajagriha. The small hill named Barari, which may be considered as the extremity of the ridge proceeding from Maher, consists of jasper, disposed in white and red blotches; and the small hills east of Sheykhpurah, so far as I saw, consist of exactly the same material. The long ridge, under which Sheykhpurah stands, is exceedingly abrupt towards the north, and has a step ascent from the south. Although split by fissures in three directions, so as to form cuboidal masses, I have no doubt, that at one time it formed a solid mass; yet its various parts have very different appearances. In some parts it is white, in others blackish, in others red, with all manner of intermediate shades. Sometimes the colours of pretty considerable masses are uniform, at others they are intermixed in dots, veins, and blotches. The red colour, I presume, depends on iron. The black seems to depend on an intermixture of amianthus, for in one specimen the silky fibres were very discernible. In some parts the grain is very fine, and in others the stone is evidently an aggregate, composed of glassy particles intermixed with others, that are powdery.

A narrow band of hills that runs for some way contiguous to the northern face of the principal range, is especially to be distinguished by it having in decay separated into schistose vertical plates, running easterly and westerly; and by a great proportion of it having been converted into the

indurated clay, which in the Hindi dialect is called Khari. It rises into various small hills or hummocks near the foot of the great range; but in general is separated from thence by a level space of arable land, and extends through the north-east corner of Sahebgunj, and the north-west of Nawada, having immediately on its north a granitic tract, which is also in many parts very much altered from its primitive appearance north from Majholighat. Khariyari is a small round hummock, deriving its name from the Khari, which it contains. The mass consists of a kind of intermixture of imperfect reddle with hornstone or quartz, which in some places contains fragments of Khari, and in others is stained yellow. The Khari has been wrought in two places. One near the bottom of the hill has formed an irregular nest surrounded by the imperfect reddle, which approaches more or less in nature to the Khari. The derivation of the Khari from the reddle is so evident, that the natives allege, that the one is the other corrupted (Sar). The mine has been conducted with very little skill. The workmen first have dug a narrow gallery into the Khari, gradually descending, until they were stopt by water, and just so high as they could conveniently reach. They have since been under the necessity of beating from the sides and roof pieces, of which every one falls to the bottom, and is brought up with much labour; and in order to be able to reach the roof, recourse must now be had to ladders. The Khari in this vein is harsh and granular, with somewhat of a conchoidal fracture, and consists of various parallel layers, reddish, white, and yellow. It adheres to the tongue; and when thrown into water, emits many air bubbles, but does not soon become soft or brittle. It comes nearer porcelain clay than any other described in authors. In the upper mine, the Khari forms a superficial vein, which has just been opened, and will probably improve, when it is wrought farther from the surface; as what has yet been dug, contains small fragments of quartz. It has more of a splintery fracture than the other, is somewhat

greasy to the feel, not at all granular, and it is of an uniform white colour with which it stains the fingers. Like the other it adheres to the tongue, and emits many air bubbles when put in water; but does not soon fall to pieces, nor does it become unctuous. It seems to approach to pipe clay. About a mile north and east from Khariyari is a village named Majholi, which has on each side of it a small hill. The hill to the west of the village has become schistose, and may be considered as in a state intermediate between jasper and indurated clay, showing the transition from one to the other.

The hill east from Majholi has also become schistose, and its plates or strata run from about east-north-east to about west-south-west. A vein or stratum of Khari has run the whole length of the hill, near its middle, and has been wrought about four feet wide, and as much deep. This very much resembles the indurated clay on the summit of Khariyari, but is intersected by reddish veins. The rock adjoining to the Khari on its south side, or towards the great range of hills, shows the transition from hornstone to indurated clay. On some parts of it I observed clusters of minute crystals, exactly resembling those in the slaggy rock of Katauna near Mallipur in the Bhagalpur district. The rock again on the north side of this stratum of indurated clay resembles strongly the kind of porphyritic mass, in which the Khari of Manasachandi in the Bhagalpur district is found; that is, in an argillaceous cement strongly impregnated with iron, it contains many concretions of hornstone and Khari. At Jharna-ghat, immediately south from Majholi, and at the foot of the great range is found an indurated clay, evidently schistose in its texture, smooth but not very greasy to the feel, and disposed in various layers, red, white, and yellow. It adheres very slightly to the tongue, and when put in water crumbles very soon, especially the white layers. Those which are red, resist longer.

At the same place is found an unctuous yellow clay called Pilamati, from its colour. It is used by potters, but the quantity is inconsiderable. It is

quite superficial, and mixed with many fragments of rock, which are separated by throwing the whole into a pit, mixing it with water, and stirring it about, until the stones subside. When the water dries, the clay is found on the surface. North-east from the hills of Majholi, at a little distance, is a more considerable hummock called Saren, or Nateswar. It consists of a variety of rocks, all decaying in vertical masses, which run easterly and westerly. In some parts is a Khari, more or less perfect, some of which has been dug, and used for teaching children to write; but it is not of a good quality. Indurated reddle, called Geru in the Hindi dialect, composes a still greater part of the hill, but it is inferior to that brought from Gwalior, with which the Sannyasis stain their clothes. The great mass of rock, especially on the north side of the hill, and towards a peak at its west end, has a strong resemblance to that on the north side of the stratum of Khari on the eastern hill of Majholi, but is evidently a very heavy ferruginous slag, containing nodules of quartz and Khari. On the south side of the hill is what I consider as siliceous hornstone impregnated with iron, and disposed in waved layers of various shades of colour, exactly like some Kharis, but very hard; nor has it any thing of a slaggy appearance. East northerly from Saren, is a mass of small hills, through which there is a passage called Dukrighat, and these small hills, being in the same line with the hummocks now described, must be considered as in the same mineral range. They consist, it is true, of an exceeding tough siliceous hornstone, composed of different thin layers of various shades of grey, and of a very fine grain. It seems to be very clear, that the hill of Khariyari, that west from Majholi, and the southern side of the eastern hill of Majholi and Saren were once entirely similar; but have been changed by the action of fire. The northern side of the two last-mentioned hills may have been similar, although this is dubious, as they are immediately contiguous to granitic hills; but at any rate they have undergone a stronger heat, part of them having been converted into slag.

Section III. Of the hills called Barabar etc.

The third great cluster of minerals consists chiefly of granite, and its central and more perfect part is what Major Rennell calls the Currumshah hills from Karnachaupar, an antiquity which they contain. Two wings are detached; one to the east, which, at Dukrighat above mentioned, joins the second great cluster on its north face, and the other to the south, comprehending the detached hills round the town of Gaya. I conclude these wings to belong to the same cluster, because in some places the granite is perfect, and the great mass has an imperfect granitic appearance, although there are several other substances intermixed, and the changes, which the two wings have undergone, differ a good deal. I shall therefore describe the centre, and then the two wings.

The centre consists of a great many detached granitic rugged peaks, extending from Dhol on the north to Kauyadol and Keni on the south, and from Hathichor and Chutiya on the east to Kharna on the west; and by the natives, so far as I could understand, is collectively called Barabar. That name is indeed also applied to one of its peaks, usually called bara (great) Barabar, although the peak called Suryangka seems to me higher, and forms a part of a large cluster; while Kauyadol is a detached peak of the most tremendous abruptness, and much more grand than the great Barabar. The whole of this central cluster consists of perfect granite, without any vestige of stratification, but differing a little in different places. At the east end of Bhayangk, near the north end of the cluster, the granite is small grained, with white quartz and felspar, and a good deal of powdery black micaceous matter. At Dihiri, the west end of the great mass, the grains are smaller, and the whole is powdery. In Kauyadol it is very fine, the grains being larger, and little or none of the ingredients being powdery. At Satghara, where the caves have been formed,

the granite is still finer, most of the quartz being glassy. In the caves I saw some granite in which the felspar was red; but could not perceive any rude block of that colour. At the cave of Nagarjuni, the east end of the great mass, the granite is exactly similar.

The only extraneous matter found among these central hills is iron ore, found in small masses lying loose at the bottom of Suryangka hill. Its internal fracture, except in colour, so much resembles granite, the shining faces of the felspar still remaining entire, that I have little doubt of its having been originally masses of that stone, changed into ore by some operation of nature, perhaps vapours from below, just analogous to what I have mentioned in my account of a mine in Mysore (Mysore Journey). The wing extending from this central part towards the east, comprehends a number of small detached hills, reaching from Saphneri on the west to Bathani, on the east. This last hill, which approaches close to the hornstone of Dukrighat, is a granite, as perfect as that of Barabar; but the other hills, though they consist chiefly of granite, contain much extraneous and some valuable matter. Great confusion prevails concerning the names of these hills, various names being often applied to the same. I shall begin with a small ridge towards the north-west, which consists of three hills forming a chain, and united at the base, and of a small detached hummock at their east end. That furthest west is called Saphneri, that in the middle is called Najara or Mahakar, and that furthest east is called Tarbigha or Dharma-pur. These hills, although they consist entirely of stones and rock, with a little mould in the crevices, are not near so rugged as those of proper granite, the masses being small and the interstices filled with earth, so that one may walk on them with ease. Neither have they any of the abrupt precipices so common in rocks of siliceous hornstone or quartz, yet they lie in a direct line between the little hill called Keni, in the central granitic mass, and the small hummock at their east end, both of

which consist of the most perfect granite disposed in great rugged masses, and entirely similar to that of Nagarjuni; nor have they the smallest appearance of stratification. Tarbigha is remarkable for a quarry of stone marl that is on its northern face, less than half way up the declivity. Below the mine the rock is a grey siliceous rock, with somewhat of a conchoidal fracture, like a hornstone; but appears to contain in it many small masses of felspar of the same colour, and clusters of black dots. Above the quarry the rock consists of similar materials, but the proportions are reversed. The black matter composes the basis, and the hornstone or quartz is the smallest ingredient. It admits of a tolerable polish. The marl forms a large bed or nest, the extent of which has not been ascertained; but the excavation is very inconsiderable. It is perfectly white, dissolves entirely in acids, and is more friable than chalk, but much harsher. It will not, like chalk, make a mark on wood; but stains the fingers. It is used for white-washing houses. It is said by all the people in the vicinity, and even by one of the men who was employed, that Mr. Law, formerly Collector of this district, attempted to make porcelain of this substance, and that at a great expense he succeeded in forming some vessels. It is scarcely credible that any gentleman should have undertaken such a manufacture, who was so entirely ignorant of its nature; and I am therefore inclined to suspect that Mr. Law used the Khari, and not this substance; and the Khari, as I have said, is found at no great distance. I was at the utmost pains to ascertain the point; but the natives from very different parts uniformly agreed, that the marl was the substance employed, and ever since it has been called Chinamati, from the name Mr. Law used for porcelain; while formerly, it is said, it was called Chuna-mati, or Lime-earth. This marl, like chalk, contains siliceous nodules; but they are not flint; they are an aggregate entirely resembling the rock below the marl. In some places the rock, immediately adjacent to the marl, is in a state of decay,

and in the transition, from the hornstone aggregate to the marl, has become an imperfect steatite, called Khungta by the native druggists. At the foot of these hills, as well as in the central cluster, are found on the surface loose nodules of iron ore.

South from this little ridge are two detached hills, Teturiya and Dhanmauya, which have entirely a similar appearance; but I did not examine their contents. South again from these is a small hummock, called Chuniya, from its containing a similar marl. The mass here is granite, which surrounds the marl on every side. This latter substance is in a large superficial nest, and entirely resembles that found in Tarbigaha, as do also the siliceous nodules found immersed in its substance. It is said that the bridges of Phatuha were originally built with lime prepared from this marl, which would no doubt be good enough. A little south from Chuniyapahar is a small smooth heap of earth, all round which are lying, on the surface, fragments of iron ore, like those at the bottom of Suryangka and Tarbigaha. Immediately south and east from this is a hill, extending about a mile from east to west, and called Bhaluya, from its abounding in bears. It consists chiefly of granite, the greater part of which entirely resembles that of Nagarjuni, and is called Urdiya by the workmen; but some, which has rather a conchoidal fracture, more resembles the stone from the upper part of Tarbigaha, although it contains less black matter, and seems to consist of white quartz, white felspar, and granular hornblende.

Near the west end of this hill, about 12 years ago, were discovered three quarries of a very heavy blackish potstone, called by the workmen Sung-musa, or the stone of Moses. It was discovered on the surface, and the veins have been followed to a considerable depth, as many vessels of this material are made at Gaya. The veins sink with a considerable angle from the horizon, and are covered by a marl 10 or 12 feet thick. The potstone consists of masses never larger than a cubit in diameter, and covered with a grey crust.

It differs chiefly from hornblende in being softer and finer grained; but, like it, contains many small shining plates, or imperfect crystals. It takes a polish, but very inferior to that of marble in lustre. One of the quarries is now entirely filled with water; for the natives have no idea of driving a level, much less of raising the water by machinery. Another has sunk 20 feet deep, and the sides falling in have killed one man, and disabled two. The marl here is exactly similar to that of Tarbigaha and Chuniya, but rather harsher. I searched both very carefully, and inquired most particularly at the workmen for marine exuviae; but could neither find the smallest trace, nor hear that any such had ever been observed. There is so little demand for the marl, that the ascent to Chuniya being easier, no one takes it away, and its removal from above the potstone is attended with a heavy expense; for it must be carried up in baskets on men's heads, by the steep ascent left in digging the quarry; as the cutting a level road is a mystery far beyond the reach of the miners. The difficulty in cleaning the quarry is very much increased by large siliceous masses, which the marl contains, and which are often four or five feet in diameter. These are dragged out with ropes, at a very great expense. They consist of materials somewhat similar to those of the nodules found in the marl of Tarbigaha, that is of a white hornstone, in which are disseminated small masses of white felspar and some blackish or dark green micaceous matter; but this, instead of forming dots as in Tarbigaha, forms large irregular blotches. Very ornamental pieces might be procured, as it takes a fine polish.

South from the hill called Bhaluya is one pretty similar, but its greatest length is from north to south. Its proper name would seem to be Jhara, but on account of a quarry that it contains, it is most usually known by the name of Patharkati. It is very rugged, and consists chiefly of granite; but its southern end is of a different nature. The greater part of this consists of a rock very much resembling the potstone of Bhaluya, but much

harder and in larger masses, although it is intersected by many fissures. It has a conchoidal fracture, and may be considered as a hornstone impregnated with hornblende. It is called the black-stone (*kala-pathar*), and is used for making pestles and mortars, for which it is well fitted. There is besides a very fine quarry of the best hornblende that I have seen. It was used for building the Vishnupad at Gaya, and, it is said, has been in use since the time of Harischandra, a prince of the golden age (*Satya-yug*), whose son Rautas built the fort, which Major Rennel calls Rotas. Harischandra was a great worker in stone, and is said by the workmen here to have first tried the Barabar hills; but, having found these too hard, he then went to Alura in the south, and dug there the celebrated temple of Buddha. At present there is no demand for this stone; but very fine masses might be procured. Its crystals are large and distinct, and it is heavier than usual; but it does not admit of a fine polish.

I now proceed to describe the northern wing of this cluster of minerals, comprehending the hills in the vicinity of Gaya. Whether or not the small hills on the east side of the Phalgu are of the same nature I cannot exactly say, but viewed at a little distance they have a similar appearance.

To commence with the little cluster near Pretsila, a celebrated place of worship described in the topography, and the part of this wing nearest the centre, the highest and sacred peak, although almost a mere rock, is not near so rugged as if it had been composed of proper granite; and, in fact, although it is an aggregate rock, the greater part of it has much the appearance of a siliceous dark-coloured hornstone, in which are disseminated small fragments of felspar. In other places, again, the granulations are more distinct, and white quartz, a black powdery matter and felspar are evidently the component parts. The small peaks at the bottom of the hill are clearly granite, although not good, and are vastly more rugged than the principal hill. The large hummock of Kewanipur at the south side of this

cluster, consists of a very strange stone, which has a good deal of the conchoidal fracture, and is exceedingly difficult to break. It has no appearance of strata, and consists of fine grains variously coloured, and the colours in general disposed in pitches like many jaspers, to which on the whole it has the greatest affinity. Some parts are of a blackish grey, with black dots intermixed; others consists of white and blackish grains, and others with the black are composed of grains which are rust coloured. In some parts the black grains are pretty equally disseminated; in others they are conglomerated into irregular spots.

The rock of Ramsila very much resembles that of Pretsila, being somewhat intermediate between granite and hornstone. It consists of three substances, one black and powdery, another greyish and splintery, and a third shining like felspar; but the hill is not near so rugged as those of granite, and the rock, like hornstone, is divided into cuboidal masses by fissures vertical and horizontal. The hill, at the east end of which the town of Gaya is situated, consists of various peaks and hummocks, composed of many different rocks very strangely intermixed. The view which I could take of it was superficial; but I have seen no place, an accurate study of which seems more likely to throw light on the various forms which, what are called primitive rocks, have assumed. The greater part consists of an imperfect granite, inclining more or less in its appearance to hornstone, like that of the hills to the north just now described. In some places this would appear to have been impregnated with hornblende, as it is very dark in colour and exceedingly difficult to break. In some places, again, that which has in most respects a very strong resemblance to hornstone, contains many small black and shining dots, as if it were a very fine grained imperfect granite. In others, again, both imperfect granite and hornstone have degenerated into a kind of sand-stone, the former spotted, the latter of an uniform white. It must however be observed, that at the east end of the hill there are large solid rocks of a perfect

grey granite: immersed in one of these at Bhimgaya, is a large mass of siliceous hornstone, the two substances being in every part perfectly contiguous. In other parts of these hills there are large rocks of quartz, white, glassy, &c. The most remarkable is a hummock, west from Brahmayoni, the masses of which have, in decay, the appearance of vertical strata; they are partly red, partly white, with a few greenish portions, and, it is said, may be cut into seals. Perhaps they may approach in their nature to cornelian, as they have a greasy appearance and admit of a polish; but all that I saw was full of rents. West from thence, the imperfect granite and hornstone is decaying in vertical schistose masses; but wherever the rock is entire, there is not the slightest appearance of stratified matter or arrangement. At the small hill called Katari, a little west from the above, is a quarry of indurated reddle (Geru), reckoned of a good quality, and used to stain the clothes of the Sannyasis, as well as a paint. Various other pursuits prevented me from visiting this place.

Section IV. Of the minerals of the plains

Having thus detailed the minerals of the hills in these districts, I shall mention a few sporadic substances that are found scattered through the plains.

The channel of the Son river is celebrated for the pebbles it contains, many of which are very ornamental, and take a high polish; but by far the greater part consists of waterworn fragments of rude siliceous rocks of various kinds, chiefly however quartz, both diaphanous and opaque, and of various colours. All the pebbles have probably been brought from the southern hills by the stream of this mighty torrent. It is however alleged that the water of the Son has a petrifying power, and that bones, old leather shoes, cowdung, bricks and various pieces of wood have been found converted, either wholly or in part, into stone; but such, if

they really exist, must be scarce; as, after a careful search, I offered high rewards for any such specimens, without the smallest success. If I am right in supposing that these pebbles come from the hills, the part of the river that I visited being near its mouth, must afford bad specimens; and, in fact, among many thousands that my people collected, I procured none that are fine: in general they entirely resemble those found scattered on the Rajmahal hills, but there are some differences. In the Son pebbles I saw much less crystallized matter, and the crystals are very imperfect, and generally shot together in a confused mass between two plates which meet at an acute angle, and are so conglutinated together as to form a solid mass, admitting of polish. The concentric layers in the Son pebbles are generally waved, and angular; but I never saw among them masses containing several concentric nodules immersed in a common mass. In the Son pebbles also, the surfaces are not so curiously pitted, although there are traces of this circumstance. Again, among the Son pebbles there are many with a red tinge, and with dark-coloured or green dendritic veins, or that are clouded, which I did not observe in those of the Rajmahal hills. I found also among the pebbles of the Son, some that admitted a polish, but that were perfectly opaque; some were of one uniform colour, partly red, partly green, and partly yellow; and, could perfect specimens be procured, they would be very ornamental; but all that I could find contained flaws, and the same is the case of those which consists of several colours, chiefly black and yellow, partly disposed in bands, partly in dendritic veins, and these last have a strong resemblance to the pebbles of Egypt. In the bed of the Son, along with these pebbles, I found a pumice-stone larger than the fist, and undoubtedly a volcanic production, which strongly confirms the idea that the pebbles of the Son have been brought from the southern hills, and that these hills, like those of Bhalgalpur, have undergone the action of volcanic fire. In a great many parts, but scarcely anywhere but near the banks

of rivers, calcareous nodules are abundant, and *are burned for lime*. They *entirely resemble those* found in Bhagalpur, but here are called Gangti and Ghanggat. I have nowhere in these districts found the calcareous tufa (Kongkar) forming large masses; although these nodules are a mere indurated carbonate of lime, the pilgrims from Bundela fry them in their curries, thinking that they thus improve the flavour of this food, which is probably imaginary.

At a village named Tal, about six miles east from Daudnagar, a substance used in medicine, and called Mus, is found in small detached masses which have a strong resemblance to the ferruginous slag, that comes from the furnaces of the Kol in Bhagalpur; and in fact near the village there is a large elevation said to have been an abode of that people; but there is not in the vicinity any iron ore, that could have been smelted. There is no doubt, that this is a metallic substance, but from its lightness it probably contains much sulphur or arsenic, although thrown on the coals it emits no vapours, and I have to regret, that my means for analysing it are so slender, as not to leave room for forming a rational conjecture on the subject. The Mus is found in a small field perhaps 30 yards square, that is every year cultivated. Two men, that I procured to dig, said, that it was found about a foot below the surface mixed with the soil, and that they never dug deeper, as the small quantity required was readily procured without farther trouble. Accordingly in digging, a hole, about three feet square, to one foot in depth, they found three or four pounds of this substance mixed with a sandy soil. I then directed them to dig to three feet in depth, the soil, as they descended, becoming stiffer. After the second foot the quantity of Mus diminished, and at the depth of three feet, I found none. To be certain however, that none is found lower, would require a more extensive search than I made. The people say, that none is to be found, except in this field, and that within it, on digging such a space as I opened, they never fail to find some; but whether

from thence we can conclude that it is regenerated, would be rash to say.

In many places of Behar, I am told, there is a saline earth, from whence a culinary salt named Dar, is prepared; but, the business being illicit, I could not discover the places where the earth is found. I have however little doubt, that this Dar is exactly the same with the Beldari Nematik of Puraniya, as the process for its preparation is exactly the same. The saline efflorescence, from whence nitre is made, is common in the villages of these districts; but is never found except in villages, where it appears on the lower part of mud walls, and on the sides of roads, that are impregnated with animal impurities. This saline efflorescence consists always of nitrate of potass and muriate of soda intermixed; but even in the same village in very different proportions. The nitrate in general predominates; and the efflorescence, in which this is the case, having a disagreeable taste, is usually distinguished by the name of Noniya mati (or saline earth); but in some walls or spots the muriate is by far the most predominant; and, its taste being more palatable, it is called Mitha mati or sweet earth. The muriate being an object of contraband manufacture it was after a very troublesome investigation, that I was enabled to ascertain this circumstance; but I have not been at all able to discover what circumstance occasions the different proportions of the two salts. It is only known, that it depends upon some local circumstance, the same spots in the same season always producing the saline matters in nearly the same proportions; a wall, that at one scraping gives mitha mati, at the next never produces noniya; and on the contrary, that which has once produced the latter, never is found to produce the former; but after a rainy season the nature of the produce is sometimes changed.* I shall have

* It is alleged, that nitre is never formed, where the soil is a stiff clay, and that westerly winds contribute to its generation. With an east wind a place that has been scraped, requires a longer time to be covered with the saline efflorescence, and the earth procured gives less nitre than that, which has effloresced during the prevalence of a west wind.

occasion, when treating of the manufactures, to return to this subject.

In many parts of the district of Behar soda effloresces on the surface of the earth, in soils that are called *Rehara*. It is confined, so far as I heard, to the divisions of Sheykhpurah, Nawada, Sahebgunj, Daudnagar, and the northern part of Jahanabad. Some people went from the latter to Tirahut, and procured instruction how to prepare the saline earth into cakes of soda, such as are usually sold at Patna. They continued to work two years, when the supply of saline earth became so scanty, that a continuance of the operation occasioned loss, wherefore the manufacture was abandoned. There can however be no doubt, that in the places where originally found, the generation of the soda continues; and in the very places, that were exhausted by too frequent scraping, the washermen of the vicinity now obtain a supply sufficient for their demand. Wells, I am assured by the natives, have been dug in these places, and at the depth of 10 or 12 cubits from the surface contain water that is perfectly sweet. In the Sahebgunj division, the soda is found efflorescing at Chakan about seven miles north from the Thanah, and at a little distance west from the Phalgu. It is scraped by the washermen, who assure me, that the same surface that was scraped, is again covered with a new efflorescence in from 8 to 30 days, according to circumstances. Easterly from Chakan, and about four miles east from the Phalgu, is a small uncultivated plain, about 300 yards diameter, through the middle of which a small rivulet winds. Soda effloresces on many parts of its surface; and, after being scraped by the washermen, is renewed in 10 or 12 days; but the quantity procurable in a year would be trifling as the efflorescence takes place only in certain spots, which are of very irregular shapes.

In the Nawada division, some way south from the town of that name, is one of the most extensive places for procuring soda, that I have seen in Behar. It extends above a mile in length, by the side of a canal used for watering the fields;

but is very narrow. The surface is carefully scraped by washermen, and by those who make glass. In the Sheykhpurah division the soda is most plenty, especially in the grams of Gokula Bawai and Lachhuyara, and is scraped by the washermen and glass-makers. The former give it no preparation, I shall afterwards have occasion to return to the management of the glass-makers. Many of the wells in these districts contain a saline water (Kharapani), especially near the Ganges, and other rivers, and particularly in the vicinity of the town of Behar. This water has rather a mawkish than a saline taste, but is exceedingly disagreeable to drink, although it is considered as favourable to vegetation, and is preferred to all others for the irrigation of gardens. In a well belonging to a house, which I occupied in Patna, this impregnation was very strong, and all in the vicinity of the gutters, into which it was poured to be conveyed through the garden, formed in the heats of spring a saline crust, which has saved me the trouble of procuring the salt by evaporation. It effervesces with acids, and is probably soda. At a little distance from rivers the water of the wells in these districts, is in general very good, although often found in clay even of a loose black nature. It very often happens, that after digging far through clay, the people neither procure water, nor come to any change of substance. In this case they expect, that the water will rise with a rush (bhur), and in order to escape the inconvenience of this, a stake is driven into the bottom, and pulled up by a rope, when the workmen have come from the well. This sudden gush is expected, whenever the workmen have dug somewhat below the depth, at which water is usually found in the vicinity, especially when the whole substance dug through has been a clay of one kind.

Potters' clay is found in most parts of the district in abundance, and tolerably good, that is to say, it makes strong rough unglazed vessels. It is in general a blackish smooth clay, and contains small pebbles. I have already mentioned the

red and yellow clays found in the second and third clusters of hills; but at Phatuha, on the bank of the Ganges, there is a bed of a fine pale yellow clay called *Rapura* or *Gori mati*. It is about four or five feet under low water mark, and perhaps 16 or 18 under the surface of the country. It is about 200 yards in length and six feet in thickness. It is a smooth, light, unctuous clay, and contains many cylindrical cavities, as if it had been perforated by worms, or the roots of plants, but no remains of such bodies can now be observed. Considerable quantities are used in Patna, and the vicinity, as a wash for the mud walls of houses; and it is said, that an essence is procured by its distillation, which is used to impregnate the essence of sandal with a peculiar flavour.

BOOK IV
OF THE STATE OF AGRICULTURE

CHAPTER I.

OF THE VARIOUS ARTICLES CULTIVATED

Near the river a great deal of the land gives two complete crops in the course of the year; but in the interior, unless we include the Khesari sown among the stubble of rice, the whole producing two complete crops in the year does not exceed one-eighth of the arable land.

One-half of the rice land in the interior gives a crop of Khesari (of the Bean tribe), sown without any cultivation, among the corn when that is near ripe. Except Khesari there is little sown without cultivation, and this careless practice is entirely confined to the low inundated parts at a little distance south from the Ganges, and seems to be rapidly on the decline, being a very bad economy.

Section I. Of the plants cultivated for their grain.

Part 1st: *of culmiferous plants*.—Rice everywhere, except on the immediate bank of the Ganges, is by far the most important crop, and much attention has been bestowed on its cultivation.

What I have to remark on its kinds is as follows.

Bora, or spring rice, if any at all is reared, is in such a trifling quantity as to deserve no notice.

In these districts the term Bhadai is never applied to rice, and the crop of this grain, which is sown broadcast and reaped in the rainy season, is here called Sathi, although it seldom completes its growth in 60 days, unless the rains are very regular or copious; notwithstanding, it is from this rapidity of growth that it derives its name. It is sown both on high and low land.

On the former it may be followed by a winter crop and differs in nothing but the name from the Bhadaï of Bengal. What is sown on low land cannot in general be followed by anything except pease. This is not the same rice with the Aswini of Bengal; it would be there called Bhadaï. By far the greatest part of the rice here is the Aghani or Khurif, which ripens in winter.

Rather more than a half of the winter rice is sown broadcast, after the commencement of the rains, and on the lowest lands. A great deal of the seed is made to sprout, before it is sown, and seed managed in this manner is here called Neocha or Angkur. The seed, which is sown early in the season, is not prepared, and is called Kharwa; that which is sown late is sprouted, which saves time. Dibbling is not in use. The broadcast winter rice of Behar is not near so coarse as that of Bengal. The ears only are removed in reaping, and the stubble is seldom cut, except when wanted for thatch; and as a large proportion of the broadcast rice has Khesari sown among it, the straw is entirely lost to the cattle. Where there is no Khesari, the cattle devour greedily, whatever is left on the field.

The transplanted rice is all fine, such as is usually sold as that of Patna; but the very finest called Basmati does not exceed one quarter of the whole, and is not of such an excellent flavour as the Basmati (pregnant with perfume) of Bareilly; but it is an article of exportation, for which at Calcutta there is always a great demand. Most of the seed for transplanting is sown after it has sprouted; and the harvest is conducted in the same manner as that of the broadcast rice. It is not here the custom to lay down the rice, before it is reaped.

The fine rice that is exported, and what is used by the high castes is mostly freed from the husk without boiling; but boiling is employed in the operation by the poor. Except a very few great families almost all the Zemindars and farmers beat in their own houses whatever rice is required for family use; for they all rear this grain. The

labour falls on the women; but most families in easy circumstances, and of rank have slave women. In the country the wives of artists and tradesmen, who have no farms, purchase rice in the husk, and beat it. What is intended for the consumption of large towns and of travellers, and for exportation, is purchased in the rough state by the low traders called Baldiyabeparis, whose wives beat a great part of it, and hire some poor women to assist. Very little therefore is in fact beaten for hire, and the rates vary a good deal. The beater always receives by weight a certain quantity of rough rice, and returns a certain quantity of clean, taking for her profit whatever surplus there remains. At Patna the rate differs somewhat according to the quality of the grain. If the rough rice is of a very good quality, when it is cleaned by boiling, the cleaner receives 60 sers [a seer is about 2 lbs.] of well winnowed and dry rough rice, and delivers 40 seers of cleaned. But with common rice the beater receives 65 sers of winnowed and dry rough rice for the 40 sers of clean. The women, who live by this business, usually work three together, and commonly clean two rupees' worth in a day, when the rice is cheap working hard, and when it is dear, giving themselves less trouble; but the annual difference, that takes place in the price between harvest and seed time is in some measure compensated by the new rice being easier to clean than the old. If the rice here is as good as that with which I tried the experiments mentioned in the Dinajpur papers, and of this there is little reason to doubt, the women will have the following wages. According to these experiments, four parts by weight of rough rice give three of clean, but the beaters return only a $\frac{4}{11}$ or 0.6154 part, they have therefore for their trouble 0.1346 of 3 rupees a day, that is rather more than 4 annas $3\frac{1}{2}$ pais, or 15 Paysas, or 5 Paysas each, while 6 Paysas are the days hire for a hard labouring man.

When rice is cleaned without boiling, an addition of $2\frac{1}{2}$ sers on 40 of rough grain are allow-

ed. As much rice is here cleaned in this manner, I tried a set of experiments on this subject, similar to that mention in my accounts of Dinajpur, the result of which is given in the Appendix. Although it will appear, that the average weight of a cubical foot of rough grain is considerably heavier than that with which I tried the former experiment, yet the produce in clean grain is considerably smaller, and a larger proportion of this consists of broken grains. According to the average result the beaters would return fully the whole of the entire grain which they procure, and would have for their trouble only the broken grains. Allowing the price of rough rice to be, as usual on an average, 70 sers (76 s. w.) for the rupee, the three beaters will have daily 9.936 sers of broken grains, which may sell at the rate of 40 sers a rupee, so that they have for their labour 14 $\frac{9}{10}$ Paysas; but if they use the rice, they have a great deal more nourishment; 3.312 sers (lb. 6 oz. 2 $\frac{3}{4}$) being a sufficient allowance, as a full diet, for three labouring people, including both grain and seasoning. The bran and husks give also a small profit; when the rice is cleaned by boiling, they do not more than supply pots and fuel.

Rice is very seldom prepared in any other manner than by plain boiling, and the water in which it has been boiled, is actually thrown away; but in towns it is given to the milch cows, that are stall-fed.

Next to rice the most important culmiferous crop is wheat. The only kind, that I examined, was *Triticum Spelta*, although some of other kinds may have escaped my notice. The greater part is watered, and is sown broadcast; but in good clay lands the watering is not necessary, and in some places, where the clay is very stiff, it is considered prejudicial. In light soils watering is absolutely necessary. Wherever it is not watered, the wheat is sown in drills; but where watered, it is sown broadcast. The wheat, which grows on sandy land, is reckoned much the finest, and is called Dudhiya-Gehunj; while the coarse grain, which grows on clay, is called Desiya-Gehung. In all

the principal towns the fine kind of flour called Mayda is sold in the market; and both Hindus and Moslems use fermented bread, baked after the Hindustani fashion. That baked in the European manner is sold at Patna and Danapur, but not at Gaya, where gentlemen's own servants bake, what their masters require. Both the flour and bread of these districts are uncommonly fine. By far the greatest part however of the wheat is used either in unfermented cakes (Roti), which, if fried in oil, are called Puri; or it is used in various sweetmeats fried in ghiu (butter) or oil.

Wheat and barley are often sown intermixed, and reaped together. The mixed grain is called Gujai. This is both made into coarse flour without being parched (Ata), and is formed into cakes (Roti); and is sometimes also parched, then ground, and mixed with cold water and salt, or extract of sugar cane to form a kind of unboiled pudding (Chhattu). Wheat straw in reaping is cut near the root as in Europe, and preserved as fodder.

Barley next to wheat is the most considerable crop, partly mixed with wheat as just now mentioned, and partly mixed with pulse. Barley is sometimes made into meal without being parched; at other times before it is ground it undergoes that operation. In the former case it is made into unleavened cakes (Roti), and in the latter it is used in the form of unboiled pudding (Chhattu); but the latter is the most common. Here barley is sown intermixed with two kinds of pulse, pease, and But, and the former mixture is called Jaokerao, the latter Jaoberra. Barley straw is preserved as fodder for cattle in the same manner as that of wheat.

Next to barley Maruya, or the *Eleusine Corocanus*, is the most considerable crop. It is raised entirely as a summer crop; but part is sown broadcast, and part is transplanted. The latter is the most common, and is chiefly reared on the ground, that afterwards gives a winter crop, which is watered from wells. This seems everywhere to have been the grain that was formerly used in such

cases; but near the Ganges maize has been introduced in its stead; and it is to be regretted, that the practice has not yet extended into the interior, as the produce of maize is larger, and there can be no doubt, that the grain is better, although as yet the natives give a higher price for the maruya. This grain is chiefly used in unleavened cakes, but is occasionally made into unboiled puddings. The straw is preserved for fodder.

Next to maruya maize is the culmiferous grain most common in these districts, but as yet it is confined almost entirely to the banks of the Ganges. The stems both green and ripe are given to cattle, but the former only are thought good. The natives are very fond of the grain, when quite young, parched in the cob.

Next to maize the greatest culmiferous crop is the species of *Paspalum* mentioned in my account of Bhagalpur. It is supposed to be of two kinds, male called Kodo, and female called Kodai. The former is by far the most common. Both are sown at the same time, but the Kodai ripens rather earliest. The greater part is sown on high poor land intermixed with Arahar. Some fields of it here also have an intoxicating quality, and it is said, that even those who reap such fields become intoxicated during the operation. It has been already mentioned, that a particular kind of lameness may be perhaps attributed to the use of this intoxicating straw; but more people think it owing to the use of Khesari; and the poor very generally sleep on the straw of Kodo in winter, as it is softer and warmer than rice stubble. Cattle eat it, but it is not thought good fodder. The grain is boiled like rice. A good deal of Kangni (*Panicum italicum*) is reared in high lands near the villages. It thrives best in a mixed soil.

About the same quantity of the *Holcus* called Janera is cultivated, but the culture of this grain is confined to the banks of the Ganges, where it grows luxuriantly, while the Kangni, being spread over the whole country, makes little show. In order to distinguish it from maize, it is usually called Gehungya (or wheat like) Janera; and it is

divided into three kinds, Raksa, Masuriya, and Narkatiya; but I have not been able to ascertain exactly, to which species of *Holcus* each of these belongs. In fact there seems to be great reason to suspect, that three or four of the kinds of *Holcus* distinguished by botanists, are much more nearly allied to each other than the different kinds of rice which the learned choose to consider as belonging to one species. It seems here also to be rapidly giving way to maize. It is often planted in a row round the fields of maize, as a kind of hedge.

Next to the Gehungya Janera, the most important of the culmiferous crops, is the kindred plant called Sama or Kheri in Puraniya and Bhagalpur.

China, or the *Panicum-miliaceum* of botanists, is here the least considerable of the culmiferous grains. Here there are only three crops, Jethuya, Bhadaiya, and Maghra, so called from the months in which they are reaped. In these districts China is used at marriages, but is not considered as so indispensibly necessary as in Bhagalpur.

Part 2nd of *leguminous Plants*. The greatest leguminous crop is Khesari (*Lathyrus-sativus*), the quantity of which sown among rice stubble is very great, and in the inundated land some is sown by itself without previous culture. All through Magadha this grain is the common material for making curries; but the poor also use it for cakes fried in oil (bara), or parch it, reduce it to flour, and make it into little balls of paste, which are fried in oil. All these preparations are only used as a seasoning with rice, or other culmiferous grains. This pulse is considered as remarkably unhealthy, and a Bengalese would give himself up in despair were he compelled to use it for a few days, even as a seasoning for his food; but this seems to be a mere prejudice, the poor people here being much more healthy than the Bengalese.

Next to Khesari the But or *Cicer arietinum* is the most important leguminous crop. The greater part is sown on land which the people cannot water, either from want of reservoirs or industry, and which gives no other crop in the year; and

such a crop may be always considered as a proof of bad farming; because this grain might be always raised as a second crop, either sown among rice stubble, or after some of the culmiferous plants that come to maturity in the rainy season. Accordingly it is chiefly reared near the Son, and in the southern parts of Sheykhpurah, where the system of agriculture is very bad. A great deal is exported, and the price has of late been enormously enhanced, probably owing to much less being now raised, as with industry other crops are, no doubt, more valuable. The variety called Kabali-but, which has a white flower, is very scarce. That most generally cultivated has a red flower, and is most commonly called Chana.

The Pea (*Pisum*) is the leguminous crop next in consequence. Linnaeus divided this grain into two species, but the authors of the *Encyclopédie Méthodique* consider the differences as too trivial to constitute a proper distinction, and hold the different kinds of pea as mere varieties; and certainly they differ much less than the various plants classed by Linnaeus in the same species with cabbage; while all the marks by which the great Swedish botanist has attempted to distinguish the different kinds of pea will be found liable to vary even in the same individual. The colours of the flowers and seed are vastly more constant. In this district, besides those reared from European seed in the gardens near Patna, three kinds of Pea are in common cultivation. The first and best, called Kabali Matar and Ujarka, has a large white seed and white flower. Most commonly there are two flowers on each common stem, but to this there are many exceptions, and to use the botanical term, the flowers are often solitary. The pea next in size and value is called simply Matar, Keras or Dabli. Its seed is about the size of the field pea reared in Scotland, and like that it has a flower of various shades of red; but the seed is not spotted and is of a yellowish green colour. The flowers of this are generally solitary, but sometimes they grow by pairs. The third kind of pea is called Kusi, Sugiya, Kara or Yasoyar. It has

a flower like the last, but its seed is much smaller, and is spotted. The leaves are sometimes denticulated, but very often entire, as in both the others is always the case. This is probably the field pea of France, which, the authors of the *Encyclopédie* say, is so small that it is only of use for feeding pigeons.

Some peas are sown on the mud of inundated lands, as the water retires; some are sown among standing rice to grow after that has been reaped; some are sown mixed with barley, and forms what is called Jaokerao; some is sown on watered land, as a winter crop, intermixed with various other articles. These are by far the best. Peas by the natives are used either split (*dal*), or made into flour, and all the meals of unparched pulses are here called *besan*. From the meal of peas are prepared sweetmeats, and paste balls (*bari*) for curries. Peas are also used alone for food, either parched or boiled, and eaten with a little salt.

Next to peas the lentil (*Ervum Lens*) is the most common pulse, and is only of one kind, called Masur. It is only used in curries, either split or made into paste balls.

The Kuthi, or Kurthi (*Dolichos Biflorus*), mentioned in my account of Puraniya is the next most common leguminous plant, and is used either split in curries, or to form the kind of pudding called Chhattu, in which case it is, as usual, parched and then reduced to meal.

Arahar or the *Cytisus Cajan* is next most common pulse. The whole reared here is of the kind which in Puraniya is called Vaisakhi; no distinctions are therefore used.

Next in importance is the Mung or Sehamung. The term Mung is applied among the natives very indistinctly to several species or varieties of the *Phaseolus* which have a hairy legumen. In general they are entirely guided in their discrimination by the colour of the seed, from whence they speak of (Seha) black, (Sona) golden and (Kari) green Mungs; but they apply these names with great confusion. The Mung of this district, which I examined at Bar, all my Calcutta people agreed

was what in that city is called Sona or golden, but its seed was green dotted with black; and in most parts of this district the same plant is called the Seha or black kind, and its seed entirely resembles the Thakuri of Dinajpur which I have considered as the *Phaseolus Mar* of botanists. My people will not however allow that the two plants are the same, and as I have not seen the Thakuri in flower, I will not take upon myself to decide the question. The Mung of this district is however abundantly distinct from the Kari or Vaisakhi Mung of the Puraniya district, which I take to be the *Phaseolus Mungo* of botanists.

The pulse of next importance is here called Bhringgi or Mothi and is the *Phaseolus aconitifolius* of Willdenow. When split, or made into paste balls, it is used in curries, and its seed is given by the natives to horses. I suspect, although my native assistants consider the Mothi and Bhringgi as the same, that the former is the Meth of Bhagalpur, a distinct though kindred species of *Phaseolus*; for at Bar I saw both plants growing; but in the tables of produce no notice is taken of the Meth, unless Mothi is the same.

Next in importance to this is the Urid, of which there are two kinds, one with a green seed, which seems to me to have been described by Rheede (in the 8th volume of the Hortus Malabaricus, plate 50) by the name of Katu Ulunu. The other kind seems to be the *Pustia Paeru* of the same author (plate 37), and has brown seeds. In the Bhagalpur district the former was called Mash Kalai or Urid and the latter was there called Aghani Kalai. The natives however speak of these plants with fully as much indistinctness as they do concerning the kinds of Mung. In the tables of produce Urid and Mash Kalai are considered as the same, but what was brought to me as the Urid at Duriyapur was the Aghani-Kalai of Bhagalpur, while that term is not in use in these districts, where the two kinds of Urid are called Mash-kalai and Bhadai-kalai.

Next to Urid the Bhetmash mentioned in the account of Puraniya and the *Cadelium* of Rumph is the most common pulse.

The least important of the pulses in these districts is the -Ghangra or Bora mentioned in the account of Bhagalpur. What I saw at Duriyapur, although called Bora, was the variety with the smaller seeds. It is much cultivated in gardens, but the fields of it are confined to Nawada.

Part 3rd : *of plants producing Oil*.—By far the greater part of the oil in these districts is produced from cruciform plants, of which three are in common use; but every thing concerning their nomenclature is in the utmost confusion.

In the tables of produce it is considered that the Turi Ratui and Gota are the same species, which is that most commonly cultivated. The plant brought to me in Nawada as Tori, which although differently spelt, I presume is the same with Turi, was the same with that called Turi and Gota in the Bhagalpur district; but at Patna a plant called Torai, no doubt the same name, is different from the above, being the Turi of Dinajpur, while the Tori of Nawada is the Sorisha of that district.

The plant that was brought to me as the Sarso of these districts, no doubt the same name with the Sorisha of Dinajpur, was the same with the Sarshong or Piri of the Bhagalpur list, the seed of which is hotter than that of the preceding, but not near so hot as mustard.

The *Sinapi Amboinacum* of Rumph is the Rayi of this district, where no great quantity is cultivated.

Next to these cruciform plants, linseed (Tisi) is that most cultivated for its oil; and the retailers of oil are very generally accused of adulterating the Tiru oil with that of linseed, which is much cheaper.

In Patna the oil of linseed mixed with that of poppy seed is that most commonly used for the lamp, and the poppy might no doubt have been here introduced; but as opium is its most valuable produce, I shall consider it under a different head.

Til or Sesamum is raised in very considerable quantities, especially mixed with Janera on the banks of the Ganges.

The *Ricinus*, called here erengri, does not occupy so much ground as the Sessmum; but, as it is generally sown by itself, the produce is much greater.

It is reckoned of three kinds, Gohama, Basanti and Chanaki. The first is the small kind with a red stem. The Basanti is also called Bara or great, and has a green ligneous stem. The Chanaki I have not seen, but it is said to be small and green. Fine oil for burning and medicine is in Patna extracted from this seed by expression alone. The seed, as in Bhagalpur, is first freed from the integuments, and then reduced to a paste by beating it in a mortar. This paste is then put into the common oil-mill, and pressed in the usual manner: 40 sers of seed give from $7\frac{1}{2}$ to 8 sers of oil, both by weight.

Some circumstances of management common to the cultivation of the country may now be mentioned.

There are reckoned three harvests:—Bhadai, reaped in the rainy season, including broadcast rice, maruya, maize, &c.; Khurif reaped in the cold season, including transplanted rice, janera, &c.; and Rabi, reaped in spring, including wheat, barley, linseed, peas, &c.

Reaping and thrashing are not here considered so disgraceful as in Puraniya and Bhagalpur; and persons of the high castes when poor, do not scruple to acknowledge that they perform these labours on their own lands.

In fact more than a half of the harvest is done by the hands of the owners of the crop, or of their slaves. The cost of harvest in such cases cannot well be distinguished from the other charges of the farm; but part is performed by day labourers and part by the ploughmen employed on the farm, who always receive some additional allowance as a compensation for the lowness of their regular wages: and this rate, whatever may be the actual charge, in all accompts is allowed as the expense of harvest, the tenant deducting this amount before the heap is divided between him and the landlord,

which in these districts is the most usual manner of ascertaining the rent. The nominal rate of harvest is in some estates $1/16$ bundle, in others $1/21$, and this is all that day-labourers receive for reaping, but they do not assist to thrash. Plough servants receive two additional allowances and Lara and Ati, but for these they assist at the thrashing floor. The bundles which the reaper receives being, as I have said, always larger than those which the owner gets, the shares of $1/16$ or $1/21$ bear no sort of proportion to the actual expense, more especially in the allowance to the ploughmen, where the rates of the Lara and Ati vary in each estate. The rates which are given in 11 remarkable vicinities to the ploughmen for reaping and thrashing, and which are allowed to the tenants as the expense of harvest, vary from $32\frac{1}{2}$ sers on $432\frac{1}{2}$ at Behar to 52 sers on 352 at Gaya, that is, from $7\frac{1}{2}$ to $14\frac{3}{4}$ per cent.; but the general average is $11\frac{1}{2}$ per cent. The general average to day-labourers, for reaping alone, is $5\frac{1}{4}$ per cent. The whole grain is trodden out with cattles' feet. In some places the grain is preserved in pits (khads) through the whole year, which is of the utmost importance as a security against fire. High places are chosen, and when the pit has been completed it is filled with straw, and this being burned hardens and dries the sides to fit it for the reception of the grain. In some places the pits are only used in spring, and no doubt where the country is entirely inundated, pits could not be used at any other season, and it is then that the danger from fire is most urgent, but the custom of pits is entirely rejected in many parts of the district where no such excuse exists. Rich people usually keep their grain in round mud-walled stores covered with a conical thatched roof, such as are called Maruka; while the poor use the vessels of unbaked clay, called kothis, or large straw baskets, (Gurha or Thek) or fence in one end of their hut with sticks and clay, and thus form a granary (Bakali) most liable to every danger of fire. All the crops called Rabi, which are reaped in spring, must in the rainy season be surrounded by wheat

or barley straw, otherwise they spoil, and are filled with weevils.

Part 4th Profit on the cultivation of grain.

The account given of this in the papers respecting Dinajpur, as explained in the accounts of Puraniya and Bhagalpur, are applicable to this district, only that the expense of harvest is here moderate.

In some places the high casts pay a less rent than the low; in others they are assessed at the same rate. Wherever the stock of cattle is sufficient, the ploughman during the seed time can do no other work, and labourers are hired to weed, to transplant, and especially to water, which is here a vast addition to the expense of cultivation; but this is repaid by a greater certainty in the crop; yet the rents here are heavy, usually amounting to one half of the crop, after deducting the expense of harvest and sometimes to nine-sixteenths. Still, however, even to those who abstain altogether from manual labour, the cultivation of grain is a profitable concern, by which the greater part of the people are entirely supported; for the produce of the dairy is a trifle, and poppy and vegetables, the most valuable articles of cultivation, are entirely reared by the lower classes. Sugar-cane is, indeed, reared in a considerable quantity, but it is entirely confined to some parts of these districts, and there is none near the Ganges, where the country is most fully occupied, and the people the most easy in their circumstances.

Section II. Plants cultivated as vegetables for the table.

In the 16th table I have estimated that there are 57425 bigahs in kitchen gardens, and that 6470 bighas in the fields are cultivated with vegetables of various sorts that are used at the table: but besides I have given under separate heads all such as are cultivated on so large a scale as to admit of a particular estimate. Fewer of the huts than even in Bhagalpur are covered with vegetables; but in many parts a great quantity of climbing leguminous plants are reared on little arbours placed in the yards by which houses are surrounded; but these I have included in the kitchen gardens.

Almost everywhere in these districts the Koeri gardeners are as skilful and industrious as those of Mungger; but many Kurmis, also, and a few Kungjras cultivate in the same manner. The poppy is one of the principal articles of cultivation; but grain and vegetables always enter into the rotation, as mentioned in my account of Bhagalpur. Near great towns many confine themselves to this kind of culture alone; but in general each family has only a small extent of garden land, and has besides a farm cultivated with the plough. The rent is high, and in the vicinity of Patna amounts to from 8 to 20 rupees a customary bigah; that is, from about 4 to about 10 rupees for the bigah of the Calcutta measure. Near country towns the rent may be half as much; in villages the rates may be from 1 to 2 rupees for the Calcutta bigah.

Part 1st. *Of plants used as warm seasoning*—Ginger is not reared in a quantity sufficient for the demand, yet some fields are to be found. Turmeric is also imported, although there are a few fields. Capsicum is not cultivated in fields, but in most parts enough is grown in small plots to serve for the demand. The people, however, are here more moderate in its use than they are in Bengal, and at Patna some is imported from Tirahut. I

observed three kinds, the *frutescens*, and *grossum* as at Mungger, and one with an annual root, which has a fusiform yellow fruit as long as the finger, one hanging down from every bifurcation of the stem. This kind is by the natives called Dhongrhimirich.

The manner of cultivating onions is similar to that in Bhagalpur, but what is there called the Patniya kind, at Patna is supposed to have come from Mambai (Bombay). Some are exported to Calcutta. There are many fields of this vegetable.

The same is the case with garlic, which is reared chiefly in poppy fields.

I observed the following carminative seeds.

The Jira mentioned in my account of Bhagalpur is the most considerable, but it is confined entirely to the S.E. part of the Behar district; and while I was there it was so young that I could not ascertain its species. It is cultivated in separate fields of a clay soil.

Dhaniya or Coriander is the next in quantity and is cultivated both in fields and gardens.

Next to Dhaniya the Ajoyan or *Ammi Dioscorides* is the most common. There are some separate fields, but most of it is reared intermixed with poppy.

Next to Ajoyan is the Saongp or Anise, of which there are a few fields.

The Randhuni of Ronggopur is here called Chandani, and there are a few fields of it also.

Soya or fennel is confined entirely to gardens. The names Soya and Saongp for Fennel and Anise are frequently confounded among the natives who use the Hindi dialect. The Bengalese names, Mauri for Anise and Sulpo for fennel are distinct, and applied with precision. Mint, called by the natives pudina (*mentha viridis*), is much used at Patna. It is made into what is called Chatni, which is prepared by beating mint with salt and various hot seasonings, and sometimes with acids, and is eaten with boiled rice or bread to give them a flavour.

Part 2: Of the plants cultivated as Tarkari—
In these districts succulent vegetables are prefer-

ed to those of a more leafy nature. That most commonly used is the baygan, including both the *Solanum melongena* and *S. insanum* of botanists. Many fields are occupied by this vegetable. The most common kind is called Manik Baygan, from three to five of which weigh a ser or two pounds. The fruit is round and black. The stems are sometimes prickly, sometimes unarmed.

The Golbhanta-Baygan is a kind of the *Solanum insanum*, with a fruit rather smaller than that of the last-mentioned plant, and it is shaped like a pear. The stem has sometimes prickles, but is at other times unarmed.

The Baramasiya-Baygan is distinguished by a cylindrical black fruit; but some kinds belong to the *Solanum melongena*, others to the *Solanum insanum*. In fact, the native nomenclature on this subject is perhaps preferable to that of botanists; and, if the Baygans are to be distinguished into different species, the difference in the shape and colour of the fruit will be found the most essential qualities by which they can be distinguished.

The Velayeti-Baygan has an oblong fruit almost cylindrical, but somewhat thicker towards the point, like a club, and it is quite white. The stem, so far as I saw, is always prickly. The Baygan is used chiefly as curry, but is sometimes pickled (*achar*) in oil, salt, turmeric, and mustard-seed.

Next to the baygan, the potatoe introduced from Europe (*Solanum tuberosum*) is the most common vegetable of this kind. Near Patna and Danapur potatoes are cultivated to a great extent. The large ones are exported to various parts for the use of Europeans, and the smaller ones are consumed by the natives. I did not observe them any where in the interior, except at Gaya, where there are large plantations; but the quantity now used by the natives is pretty considerable. They are never used as a succedaneum for grain; they are merely dressed as curry, to give a seasoning to rice or cakes, and they are considered as unwholesome. They require to be watered, and

are manured with dung and ashes. The same field usually gives potatoes every year, and besides, in the intervals between the crops of this root, it gives one of vegetables, and another of maize. Such land is of a good soil, and lets at 8 or 9 r. a Calcutta bigah, or at about £3. an acre.

The kind of bean called Sema is the next most considerable vegetable, and seems to occupy much more ground than the potatoe; but the produce of a bigah is comparatively trifling. The green pods are made into curry, and are pickled in the same manner as the Baygan. The ripe seed split is also used in curries.

The plants most commonly included under the name of Sema are the different varieties of the *Dolichos lignosus*, of which there are many; but the *Dolichos Lablab* and the *Dolichos Gladiatus* of botanists, and the *Dolichos* called Kursa in Bhagalpur are included under the same denomination, although the quantity of them that is reared is quite trifling. The first is here called Ghya Sem; the second Barsema; but the same name is given to a variety of the *Dolichos lignosus* that has a large pod; the third kind is at Bar called Parbi-Sem.

Next to the beans called Sema the cucurbitaceous fruit called Taroi, which is the *Patola* of Rumph (Part 5, page 405) and the Dhondhul of the Ronggopur list, although at Mungger another species of the same genus (*Petola Benalensis*. Rumph, vol. 5, plate 149) is called Taroi or Torai. It is used in curries.

The succulent vegetable next in importance to the Taroi is the *Arum peltatum* of the Encyclopédie. As at Mungger there are two kinds, one with a large leaf which comes to maturity early and one with a small leaf which is later. At Mungger the former was called Pekchi and the latter Aruya; but at Patna I find that the terms Pepchi (evidently the same with Pekchi) Aruya and Kachchu are considered as synonymous and are applied to the larger leaved kind, which is that chiefly cultivated, while the other is called Magahi Kanda, although it is not at all common. It is

only used in curries, but both roots and stems (petioli) are eaten.

The next most common vegetable is the Karelu, which is the *Momordica muricata* of Willdenow as at Mungger.

The Karela of Mungger, or *Momordica Charantia* of Willdenow is here known by the same name and is the vegetable of next importance. It is reckoned of two kinds or varieties, as botanists say. The first, or Jethuya, is a plant growing in the heats of spring and dying with the first rain. The figure given by Rumph (Vol. 5, plate 151) represents the fruit tolerably well; but his description by no means agrees well with either variety, as he says that the fruit is triangular. The second kind, called Baramasiya, lasts throughout the year, and is evidently the *Pandi pavel* of Rheede (Vol. 8, plate 9). The Karela is only used in curries and is bitter, a taste which the natives do not dislike in this dish.

The cucurbitaceous fruit called Taroi, which is the *Petola* of Rumph, is used in curries; as is also Taroi (*Arum peltatum* of the Encyclopédie), and the Kareli, which is the *Momordica muricata* of Willdenow.

The Surajkonghara of Patna is the pumpkin, which, in the account of Puraniya, I have called *Velati kumra* and *Kadima*. It is used in curries, and is preserved as a sweetmeat in honey or syrup, having been first fried in butter. It is also made into a dry confection by frying it in butter, then dipping it in syrup, and drying it. It is made into balls used in curries, by beating it, with split pulse, into a paste, adding carminative seeds, ginger, asafoetida, and salt, or sometimes capsicum. This paste is made into balls, which are dried in the sun, and will keep a whole year. When used, these balls are fried in oil or butter, and put into the curry.

The Kaduya, or gourd, is the *Cucurbita leucanthema* of the Encyclopédie. Religious mendicants who are poor use its ripe fruit for bottles. There is a kind, which has a very small fruit, so bitter that it cannot be eaten; but it is cultivated

by fishermen, who float their nets with its fruit. The radish (*Raphanus sativus*), here called Murai, is used fresh in curries, is eaten raw, and is pickled in oil, salt, turmeric, and mustard-seed. The Ramtaroi, or *Hibiscus esculentus*, in these districts is much more used than towards the east, and I observed several fields and plantations of this vegetable. It is only used fresh by the natives as an ingredient in curries; but Europeans use it in soups, while they reject most of the vegetables of which the natives are fond. The Calladium, which Rumph calls *Tacca*, but which is by no means the *Tacca sativa* of botanists, although they quote Rumph, is here called Ol, and is a good deal cultivated. The root is used in curries; and, after having been boiled and dried in the sun, is pickled in oil with salt, mustard-seed, turmeric, and ginger. Some, which is brought to Patna from Tirahut, retains always a considerable acrimony; but that which grows in the southern parts of the district, in a clay soil, is quite mild.

Next in importance to the Ol is the cucurbitaceous fruit called Jhingui or Kharro, which is the Jhingya of Rumph, the Jhingli or Torai of Bhagalpur, and the Picinna of Rheede (Vol. 8, plate 7). It is only used in curries.

The same is the case with the Satpatiya, which is the next most common vegetable, and is the same with the species of Suffa so called in Puraniya and Bhagalpur.

The carrot (Gajar) is the vegetable next in importance to the Satpatiya, but is here given to cattle only as a medicine. The people eat it both raw and boiled, and preserve it in honey or sugar in the moist manner (Morabba). It is not used in curries. Whether or not it is as productive here as at Mungger I have not been able to ascertain. The Suthna and Suthni are larger and smaller varieties of the *Dioscorea* called *Suthni* in Puraniya. In different places of these districts there are a good many fields of this vegetable. It is used as a succedaneum for grain, boiled as we do potatoes, or is dressed in curries or is made into meal (Mayda) by cutting it into slices, drying it in

Section IV : Of plants cultivated for their saccharine juice

Besides the palms, and the Mahuya tree, already mentioned, the only article under this head is the sugar-cane, which is cultivated to a large extent. It was estimated, that this amounts to 20,000 bigahs. The kinds are Ketar, Baruka, Mango, Shukurchina, Raungda, and Paungdi. The three latter are thick, and their juice is very sweet, on which account they are eaten, but are not used for expression. The Ketar is the kind with stems no thicker than the finger, and is said to be the most common, but I saw none of it; my people however recollect a great deal. It seems to be the same with the Keruya of Bhagalpur. All the three kinds, in common use for the mill, have yellow stems. The crop lasts 18 months; but ratoons of the Ketar occasionally are preserved, in which case there are two crops of cane in two years and-a-half, but the second crop is very poor. During the six months that remain, either after the one or the two crops of cane, to complete the two or three years, the field gives a crop of grain, after which the cane is again planted. Any high good land, whether stiff or free, is chosen for this valuable plant, and it is carefully watered, and in some places is allowed a little manure; but in others it is alleged, that, if manured, the cane, although it grows more luxuriantly, gives a poor juice, that is not fit for yielding extract. The extract is chiefly of the thinner kind preserved in pots, and the average produce in different places is stated at from 10 to 12 mans a Calcutta Bigah, which seems to me a fair enough estimate.

Section V: Plants used for chewing and smoking

These are of considerable importance, although betle-nut and bhang are not reared, and the quantity of tobacco is altogether inadequate to the demand; but the poppy (or opium) is cultivated to a great extent, and is one of the most productive sources of revenue to government. The poppy is always cultivated near villages in garden land, which is carefully watered, and gives at least one other crop, while some things are almost always sown along with it, especially onions, garlic and coriander, while a hedge of *carthamus* is usually reared round the plot.

This has been prohibited by the agent, for what reason I do not exactly know, as he pays only for what he receives. It is probable however, as he advances money to the cultivator in proportion to the extent cultivated, and makes the estimate of what he may advance on the supposition of a full crop, that, by rearing other things along with the poppy, the cultivator is unable to fulfil his engagements, and thus part of the money that has been advanced may be lost, for the cultivators have no sort of inclination to fulfil their engagements further than they can be compelled. Whatever orders the agent may give, I know that little or no attention is paid to them unless in the immediate vicinity of where he resides. Both poor and rich are perfectly satisfied to receive the advances, which shows that the business has been conducted on liberal terms, and, if any difficulties should occur, it must be owing either to the fault of the native agents employed at out stations to receive the opium, or to the obstinacy of some leading zemindar, for such a person, notwithstanding the whole influence of the agent, could undoubtedly prevent every tenant that he has from rearing a grain. The native agents have it in their power to do a great deal of mischief, and therefore it is highly expedient that the European agent should

frequently visit the country to hear complaints, and that he should be authorized to give summary redress. As everything depends on the quality of the drug, the agents who receive the juice, as collected by the cultivators, must have the power of rejecting any that has been adulterated; otherwise no cultivator would fail to practise this fraud; but here a difficulty occurs; the cultivator can sell to no one else, and the agent may say, "Your opium is bad; I shall give you only half price for it." The cultivator must take this, being unable to sell his drug to any other person, while the agent charges the full price to the Company. I have heard vague accounts of such things being practised, but I am doubtful of their truth. It is however, evident that frequent visits from the European agent, and the power vested in him of dismissing even suspicious characters and of severely punishing proven defaulters are the only sure means of preventing such abuses, which, if tolerated, will fall chiefly on the revenue, as they must diminish the cultivation, unless a price is given for the raw drug that will make up to the cultivator for the extortions of the subordinate agents. Where the profits of government are so enormous, no possible means can altogether prevent smuggling; but in these districts, the extent to which that is carried on is, I believe, very inconsiderable, and the principal danger arises from districts where no purchases are made by government. The quantity that I know was raised in Ronggopur, and is probably still raised at Koch Vihar, vastly exceeds all the smuggling here, and probably amounted to a half of all that government procures. The remedies most to be depended on against smuggling, independent of vigilance on the part of the agents, seem to me to be as follows.

1st. The rendering every zemindar liable to a heavy fine, where proof can be found of cultivation unallowed by the agent.

2ndly. Rendering the actual cultivator and smuggler subject to severe punishment.

3rdly. The employing inspectors to visit suspected places and to prosecute defaulters.

4thly. To carefully prevent all unfair dealings on the part of the subordinate agents towards the fair cultivator. The proper check, as I have said, against this is frequent inspections on the part of the chief agent, but where the cultivation is much extended, that is impracticable. It would be of great consequence, therefore, to confine the cultivation to as narrow a space as possible. At present the agent at Patna makes his purchases from the districts of Patna, Behar, Ramgar, Shahabad, Saran and Tirahut. With some pains it seems very practicable to procure the whole in Behar alone. The land near Patna has become so high rented that the people there are rather abandoning this cultivation, and cannot afford to rear the poppy on the best soil; but the whole quantity of land required is so small, that with pains it might probably in a few years be procured in the extent between the towns of Behar and Daudnagar, which on the whole seems to be the line most favourable for the cultivation.

At Arwal it was said by the native agent that the people lost by the cultivation, and he gave the following statement of the expense and produce of a bigah of the customary measure, equal to 27778 square feet.

EXPENSE			PRODUCE		
		Rs.A.			Rs.A.
Rent	...	6 0	crude opium 8 scrs (66		
14 days ploughing		1 12	SW) @ Rs. 1 9/16	12 3	
forming trenches	4 days		poppy seed 4 mans	3 3	
watering	24 "		Loss	3 ...	2 7
gathering	80 "				
wedding	80 "				
	188 "	10 6			
		Rs. 18 2			Rs. 18 2

This account, as usual with most such procurable, is quite fallacious. In the first place the whole rent is charged on the crop, which is not fair; on this account we may allow a deduction of at least 1 Rupee. Secondly, he allows full days wages for collecting the opium, whereas the people are only employed about one hour in the evening and two hours in the morning, so that these 80 days labour should only be valued at

one Paysa each, which will reduce the charge $2\frac{1}{8}$ Rupees. Then the produce is underrated; for he says that 1632 bigahs, for which advances were made, actually sent to the factory 425 mans, which is at the rate of 10 sers a bigah, and probably the quantity really cultivated was rather less than that for which money was advanced; 2 sers more opium must therefore be allowed, making an addition of $3\frac{3}{8}$ R.

Add therefore to the produce $3\frac{3}{8}$ R.

and there will be

Rs. 18 13

Deduct from the charges $3\frac{1}{8}$ Rupees

and there will be

„ 14 5

Gain besides recompense to the family

for labour

Rs. 4 8

At Behar they gave me the following account :

CHARGES	Rs.A.	PRODUCE	Rs.A.
To rent of one bigah, same size as above	5 0	6 Sers (76½ SW)	10 8
15 days ploughing	1 6½	Seed 1 man	2 0
48 days	2 4	Vegetables	0 8
32 days watering	2 7	Safflower	1 0
Gathering—20 peoples			
days wages	0 15		
Seed	0 1½		
	<hr/> Rs. 12 2		<hr/> Rs. 14 0

The charges here seem fair, but the produce, especially that of the seed, is probably somewhat underrated. It is however rather smaller than at Arwal because many more things are intermingled with the poppy.

At Patna I understand that, owing to a plentiful manuring, the produce of a bigah is nearly double to that stated at Behar, but even this will not afford the rent of 14 or 15 Rupees a bigah instead of 5.

The value of the opium stated in the tables is merely that paid to the actual cultivator. Many other expenses must be incurred before it is brought to market. One of the heaviest, besides the pay of a very great establishment and the carriage from the interior, is the loss of drying, which is entirely done in the factory at Patna. It is brought there in pots, just as collected from the

plant, and in drying, I am told, it loses from $1/10$ to $1/8$ of its weight. As it dries, it is formed into lumps, which are wrapped up in coverings made of the flower leaves (Pattal) of the poppy; joined together by placing them, when fresh, on a hot earthen pot. Some women make a living by preparing these coverings, which are sent to the factory ready joined."

In the evening, as each capsule come to the proper degree of maturity, a slight incision is made its whole length, next morning, what opium has exuded is collected. After two or three days another incision is made at some distance; and according to the size of the capsule it admits of being cut from three to five times; but the whole crop season lasts one-and-a-half month, as the capsules advance to maturity at very different periods. The extraction of the opium does little or no injury to the seed, which is chiefly used for making oil, but a little is used in sweetmeats. Among the natives the oil is used both for the lamp and for frying cakes, but it sells lower than that of mustard seed. To European taste it is not quite so execrable. Some of the young capsules, before they are fit for the extraction of opium, are dried, and preserved for making Mudut. That used here is a hot infusion of the dried poppy heads. The preparation is made by squeezing, and rubbing the substance among the water with the hands, in a disgusting manner. The leaves of the young poppy are used as a vegetable. Saline water, as I have said, is the most favourable for watering the poppy, and the sweepings of roads and old houses, where there is a saline efflorescence, mixed with ashes, and any dung that can be procured, are given as a manure.

Tobacco is grown only to the extent of 480 bigahs.

The betle leaf of Magadha is considered superior to all others, and is sent to Calcutta, Lucknow and Benares; but it is alleged, that a very little only is cultivated, and that most of the gardens are planted with the Bengalese kind, which is much more productive, and therefore the

value of a bigah is fully as great, while the sale, owing to its cheapness, is more certain. It was stated, that the whole extent of betle garden is only 265 bigahs, and in fact I saw few or none. The annual produce is estimated worth 300 rupees a bigah, an estimate which I do not think liable to much objection. Since all duties have been removed, the Zemindars lay on additional rents, which now, I am told, amount to 40 rupees a bigah. A great quantity of the leaf used in Patna is imported from Tirahut.

Section VI: Of the Plants used for dyeing

Indigo in these districts is of very little importance, and its cultivation is on the decline. The Zemindars are in general much averse to it; and Raja Mitrajit has expelled it entirely from his great estates. Several factories have been totally abandoned, and the seven which now remain, I suspect, are far from thriving. I received no information from their proprietors, and all that I have to say on the subject is taken from the report of the natives. In some places the price is six bundles of $5\frac{1}{2}$ cubits circumference; in other places the price is from 12 to 16 bundles of $3\frac{1}{2}$ cubits. The indigo planter pays also the rent of the ground, and I understand advances at the rate of 3 R. for the large bigah, or rather more than $1\frac{1}{2}$ R. for that of the Calcutta measure. Some is preserved for seed, but scarcely enough to supply what is sown in the district. In one corner of Sahebgunj Mr. Christian of Mungger had induced the people of the forests to sow 2 or 3 bigahs entirely for seed, and I never saw anything more thriving. It was new cleaned land and would give a very good return, but was of so trifling an extent as not to have been introduced into the tables of produce. A few bigahs in different places are cultivated by the dyers for making indigo after the country fashion.

The total number of bundles being 1,69,000, and some being larger, some smaller than in Puraniya, the average size will be nearly the same. Allowing therefore 257 bundles to give a man, we shall have 657 mans for the produce. Kusum or Safflower is cultivated to a considerable extent; 1,500 bigahs are sown with this alone, and a great deal is scattered through other crops, especially in rows round poppies, and round vegetables for the kitchen.

I have nothing to add to the observations formerly made on this plant.

Section VII: Of Plants cultivated for rearing insects.

Near Patna a little lack is reared on the two varieties of the *Ficus religiosa* of the Encyclopédie, called there Pipal and Pakar, and on the Jujub; but not in all above 200 trees are employed. In several of the wilder parts the lack, found spontaneously nestling on the wild Jujub and Paras trees is collected; but the whole quantity thus procured is quite inadequate to the demand. It seems strange, while the rearing this insect is attended with so little trouble, that enough should not be everywhere reared to serve for the demand of the vicinity.

In these districts no plants, except the palms already mentioned, are cultivated, for making mats.

Section VIII: Plants cultivated for feeding cattle

The only things that come under this class are Khesari and Janera, above mentioned among the grains. When the Khesari grows very thick, some of it is plucked and given to cattle, and when a field of Janera looks as if the produce of grain would be trifling, the stems are cut, when still green, and it is in this stage only that they are here reckoned a good fodder. The quantity of forage on a bigah of good Janera is very great, and should the feeding of cattle ever become an object in this country, the best fields of it might be employed in that manner to great advantage. The Khesari is a still more valuable supply, as it comes at a season of great scarcity.

There are several plants which grow as weeds among the winter crops that might be cultivated with great advantage as artificial grasses. They would require two or three waterings in the season, but I have no doubt would bear that expense. These, which I observed, were as follows.

Medicago cordata vel *lappacca* of the Encyclopédie called here Bokehi.

Medicago lupulina, called here Osna and Amrora,

Trigonella monspeliaca, called here Banbuti.

Trifolium indicum, called here Banmethi.

A *Trifolium* allied to the above, but not yet described, called Banmetha.

Vicia sativa, called Bara Akta.

An *Ervum* very like the *Hirsutum*, but it is not hairy. It is called Chhota Akta and Misiya.

One of the plants however that deserves most peculiar notice is a species of *Conysa*, which in Holasgunj is called merely Ghas, that is, herbage; but cows are fond of it and it seems to resist the violent heats of spring. If sown thick, and allowed

one or two waterings, I think it promises to supply an abundant forage even in the worst seasons.

Lucern I found sold in the markets of Patna, where it is called Maruyan, but I am told that it was brought from the gardens of Europeans, where it has become wild among the herbage that is watered for the sake of verdure, and cut in order to look neat. The workmen sell the cuttings to great advantage.

During the rainy season the natural pasture of tolerable land is exceedingly productive, and a very small proportion of the country would feed a great many cattle, and provide hay for their existence throughout the year; and the pasture here, while it lasts, seems to be much superior in quality to that of Bengal.

CHAPTER II.

OF THE IMPLEMENTS FOR AGRICULTURE

The plough everywhere in these districts has a bit of iron, but does not differ materially in shape from that of Bengal. The cattle, although in a condition equally wretched, are in general stronger made than those towards the east. Each pair of cattle works only the third of a day, and when the stock for each plough is complete, that is consists of six cattle, the ploughman in the season of tilling, that is from the beginning of June until the end of November, does no other work. If there are only two pair, he cuts grass for them; and, if there is one pair, he assists in weeding and hoeing the farm. When small farmers have only two cattle for each plough, two of them usually unite, as four cattle are required for the instrument called Chauki, which is in universal use. In lands that are not watered, wheat, barley, masur and linseed, are sown with the drill called Chongga, which has been mentioned in the account of Bhagalpur.

The instrument like a ladder, called Mayi, is no where used in these districts; the beam called Chauki is universally employed in its stead. It is not everywhere that the improvement of the hook has been added to this instrument; but it is usually dragged by an iron chain. One Chauki serves for ten or twelve ploughs, and poor people unite to purchase this implement, which on account of the chain, is expensive, costing about 1½ Rupee.

The Bida or rake drawn by oxen is not here in use.

In these districts I have seen three sickles used. That used for cutting most kinds of corn is small, has teeth, and is called Hangsuya or Hangsuli; that used for cutting grass is the great Hangsuya and has no teeth; and that used for cutting sugarcane, Janera and maize is like a crooked bill, having no teeth, and is called Garasa.

The hatchet can scarcely be called an implement of agriculture, as it is chiefly used to split firewood; but most farmers have one. There is nothing remarkable about the weeding iron (Khurpi) nor bill (Das).

There are three kinds of hoe: a large quadrangular hoe used for digging fields and gardens, and called Kodali or Phaura; one with a triangular iron used by those who dig ditches and tanks, and called by the same names, and a small quadrangular hoe called Phauri, used for weeding.

Almost every family has a Denghi for beating rice. The mortar and pestle is little employed.

The sugar mill entirely resembles that of Bhagalpur. The whole expense is about 31 rupees, and the machinery requires to be renewed once in five years. Some old iron remains, but that does not more than pay for annual repairs. The machinery therefore costs six rupees a year, bills one rupee, pots one rupee, cattle hired by the season six rupees. The total annual expense is therefore about fourteen rupees. This is usually raised by a contribution among those who use the mill, no person having as much field as one mill will clear, although this does not exceed 10 bigahs Calcutta measure, or about three acres. They mutually assist each other at the mill.

Carts and cars form no part of a farmer's establishment, nor is the produce of his fields ever carried home by means of cattle or carriages of any sort except from the threshing floor, which in the dry season is often at a distance from his house, and except some sugarcane and maize that are occasionally carried home by buffaloes.

The only other implements of agriculture are those employed in the irrigation of the fields, to give an account of which I now proceed, as being the principal manure.

CHAPTER III.

ON MANURES.

By far the greater part of the cow dung is burned for fuel. The farmers indeed talk of manuring their land; but from the above-mentioned circumstance the quantity that can be given, must be very trifling, nor did I see any thing like a dung-hill. The sweepings of the roads and walls impregnated with nitrous salts, and ashes and other soil from about the house, are however collected, and given to kitchen gardens, to rich crops near the villages; and to the seedlings of rice, that are intended for transplantation.

Bottle-leaf is manured with fresh earth. Wherever sheep can be procured, they are at night collected together on the fields, which it is intended peculiarly to enrich, and in some places the same is done with black cattle; but in many parts this is neglected. A great deal more pains is bestowed on watering the land than even in Bhagalpur; and, wherever a copious supply is given, other manure seems to be little required. Where the soil is clay, rice will come to maturity without assistance; but the crop is poor and uncertain. Where it is light, irrigation is absolutely necessary. To secure a regular supply during the occasional intervals of fair weather, that happen in the rainy season, and to provide for the want of water, which happens when this ceases early, recourse has been had to both canals from rivers and reservoirs, exactly on the plan of those in Bhagalpur, but more numerous. The land in the reservoir, which in the rainy season is covered by the water, if the reservoir is small, and dries up in time, is usually cultivated for a winter crop of wheat, barley, or pulse; but the larger tanks do not admit of this economy, at least over their whole extent, and in some places it is neglected. The fish, where much water continues, is usually

a sufficient remuneration for the loss of the crop, and at any rate defrays the expense of keeping the reservoir in repair. Large reservoirs have a bank of a mile and upwards in length, but do not form above one-tenth of the whole. Such may cost in forming about 500 rupees; the more usual size cost from 25 to 100 rupees. The people who dig, are usually paid from two and-a-half to four rupees, for 100 Sekunduri cubical guz (2 feet 9½ inches long), according to the depth of the ditch, and height of the bank, which constitutes the reservoir. It was in some places reckoned, that every 1000 bigahs of rice land, requires a bank of from 150 to 100 bigahs in length. In other places it was alleged, that 50 bigahs in length would only water 100 bigahs of land.

Many of the canals are several coss in length, and in the dry season convey large quantities of water, often more than remains in the channel of the river. The expense both of making and repairing the canals and reservoirs is entirely defrayed by the Zemindars, who appoint proper persons to divide the water among the tenantry. During the height of the floods these canals and reservoirs afford a supply, by merely allowing the water to flow on the fields through sluices, which usually consist of a hollow tar tree, the end of which is filled with clay, when it is intended, that the water should be confined. In the canals the water is raised to the level of each man's sluice by a small temporary dam of earth. Towards the end of the season the water must be raised from both reservoirs and canals by machinery. The basket suspended by ropes, called here Changr, is sometimes used, when the quantity of water remaining is small; but, when the quantity of water is considerable, the machine like a canoe is used, if the height, to which it is to be raised is small; while the pot raised by a lever is preferred, when the height is considerable. The trouble attending this is not so considerable as might be imagined; because, after the fields next the reservoir have been filled, the same water is allowed to flow on others without any additional labour.

Both canals and reservoirs contain also so considerable a supply, that they enable the farmer not only to bring the crop of rice to maturity, but, by the means above mentioned, enable him to rear a winter crop of wheat, barley, &c.

The greater portion of such winter crops, and of vegetables, and sugar-canes, is watered from wells which are of two kinds. Indaras lined with brick, and kuyas which are not lined. The former are usually made by the Zemindars, the latter almost always by the cultivators.

The usual method of raising the water is by means of a pot suspended from a lever, which has been already described, and is here called latha; it is always here wrought by one man, who stands under the end of the lever on the side of the well next to the fulcrum or post on which the lever moves. This seems a preferable situation to that chosen in Mysore, where the workman stands in directly the opposite position. About one-half of the pots used here are iron, which increases the price much, as an iron pot costs a rupee, while the lever and rope do not cost above four anas, and an earthen pot costs half an ana, but it is often broken. Although one man works each lever, yet it is usual for three levers at least to be wrought in the same well at the same time; and still more, if practicable, is advantageous, because one man can distribute the water raised by four or five lathas, and one man is necessary where only one latha is employed.

Still, however, one latha is often used, because the two men, alternately relieving each other at the lever work with ease the whole day, while four or five men, with only one relief, can scarcely continue to work so long without much fatigue. Many lathas are employed where the well is from 25 to 30 cubits deep; but when the depth exceeds 15 cubits, it appears to me that this is a very tedious operation, and vastly inferior to the leathern bag raised by oxen descending on an inclined plane (Mot); but except near the Ganges such are seldom used, and the kind which requires a man to empty the bag is alone employ-

ed; but in some places I perceive that one man suffices to work the machine. He stands by the well and empties the bag, while he has trained the oxen to go down and slope and to return without being driven. In the interior, indeed, the wells are seldom deep, but near the Ganges the latha is vastly more common than the mot, even in the deepest wells. The reason seems to be the want of forage for the cattle in the working season. I tried an experiment on the comparative effect of these two methods of raising water. A latha from a well, in which it was 36 feet from the water to the surface, in half an hour drew 1357 lbs. avoirdupois of water.

Two men usually work from sun-rise until nine o'clock, and from three o'clock to sun-set, or rather until dark. Where the depth is moderate, three men with two lathas water from about $\frac{2}{3}$ ds of an acre to $\frac{1}{3}$ daily.

Three men and two oxen work a Mot from morning until evening, with a refreshment only of about $\frac{3}{4}$ of an hour. In a well 33 feet from the surface to the water, a Mot in half an hour drew lb. 7210, but such a superiority over the Latha is not admitted by the natives, who contend that three Lathas wrought by four men are equal to a Mot wrought by three men and two oxen. This, however, I have no doubt is a mistake, unless where the water is very near the surface.

CHAPTER IV.

OF FLOODS AND EMBANKMENTS.

There are no embankments for excluding floods of considerable size, but many of a kind that I had occasion to recommend in the account of Dinajpur. Parts of the country, between Behar and Bar especially, that are subject to inundations of moderate depth, have been secured from superfluous water by banks of no great height which surround small spaces of land. These formerly gave only winter crops; they have now been converted into the richest land for rice, as their supply of water is certain and, although one bank may occasionally give way, little or no harm is done, as it can be soon repaired and the superfluous water thrown out. This new rice land is called Khandawat. The spaces surrounded by these banks are usually from 1 to 400 Calcutta bigahs in extent. Some however contain 2000 such bigahs and others only 10. The banks are from 1 to 6 cubits high and from $5\frac{1}{2}$ to 22 cubits wide.

CHAPTER V.

OF DOMESTIC ANIMALS.

In the account of the condition of the people and in the 13th table will be seen an estimate of the number of tame elephants, camels and horses that belong to the natives of these districts as appertaining to their personal equipage.

Horses are not here used for the conveyance of goods. Very few of the larger kind are bred here, they are brought from Tirahut or the west. The ponies (called here Chhanathi) are by no means better than the Tatoos of the east, and in spring, except in Patna, are truly wretched, as they receive no food except what they find in the fields, and scarcely any vestige of grass then remains: they are fully as dear as in Bhagalpur. An estimate of the number of other kinds of cattle will be found in the 36th statistical table.

The asses are chiefly employed by the washermen, but in the town of Patna many of them are used to carry bricks and mud for building. Among them, by accidental intercourse, are some mules, but procreated by male ponies on the she asses, and therefore very bad. They are wrought in common with the asses, and belong to the lowest dregs of impurity, so that every decent person is totally unacquainted, or pretends to be so, of all circumstances; but I have heard that these mules very usually breed. Oxen are in general superior to those in Bengal, and in no part of the district except on the S.E. Frontier are they much inferior to those of the north western parts of Puraniya. The labouring cattle are therefore considerably superior in quality to those of any district hitherto surveyed, and no doubt must be able to cultivate more land in proportion to their numbers. I think the difference however can scarcely be so great as was pretended by the

natives, on whose authority the numbers have been estimated, and that this part of the stock is underrated.

Owing to the scantiness of forage, few cows are kept, so that very many cattle ought to be imported, but a great importation is not alleged; the number said to be imported is not indeed more than sufficient to supply those used in carriages or for the transportation of goods, for which purposes the cattle bred in these districts are seldom fit. The cattle used in sugar mills are also chiefly imported. They work also in the plough. Those wrought in oil-mills are usually of the poorest breed but do no other work. The cattle employed both to plough and carry back loads chiefly belong to rich farmers, who at harvest employ them to carry the grain home from the thrashing floor. The great causes of degeneracy seem to be the scarcity of forage and the practice of working bulls, which notwithstanding their miserable condition, are allowed to breed. The number of consecrated pampered bulls is not great and can have no effect on improving the breed, and although a good many bulls are kept for breeding alone, I nowhere heard that any pains or expense was incurred in their selection.

Bulls sell lower than cows, and these lower than oxen. The breed, however, is not rendered worse by working the cow, a practice that would not here be tolerated; any person attempting to do such a thing would be considered as a monster, and be in the utmost danger of popular violence.

By far the greater part of the cows give a calf once in the two years and usually have five in the course of their life. Perhaps one-tenth give a calf in three years and in the course of their lives breed only three or four times. About four per cent. may breed once a year and may in all have six or seven calves. The whole quantity of milk that these give does not exceed two-thirds of what is given by those who breed once in the two years, but this is on some measure compensated by the additional calves. Those who breed once in three years, not only give few calves, but the total

quantity of milk which each gives scarcely exceeds a half of the quantity that a good cow yields. On this account it seems to be a good economy in the people of Bengal to convert such into labouring cattle.

An estimate of the whole quantity of milk that the owners of the cows receive and of its value will be found in the 37th table in the Bhagalpur, where a small number of persons has 20 lak of rupees worth of milk, this article is in general dearer than here where a greater number procure only to the value of 16 laks. The reason seems to be that the cattle of Bhagalpur are generally sent to the wilds and their milk is made into Ghiu for exportation, while in these districts the cows are kept at home, and most of the milk is used on the spot. On reconsidering these circumstances I am led to think that the exports of Ghiu from Bhagalpur must be much more considerable than I have stated in my report. Near Patna the milk is miserably watered, but in the more remote parts the people have more conscience.

Of pasture there is 27 square miles of inundated land, mostly covered with long coarse grass, often preserved for thatch, by which it is very much injured as pasture; 348 square miles of woods or scattered bushes; about 80 miles are of the latter description, and in the rainy season are excellent pasture; but in the dry season they are quite parched, and it is the bushes only that retain verdure. The woods are not such good pasture in the rainy season, but in the dry they are less parched. The people, however, of this district, who live at any distance from the woods, seldom avail themselves of this resource, but keep their cattle at home, and the mango groves form what they call their Bathan. The cattle are sent there more for the sake of getting air in a cool shady place, than for the sake of the pasture; although in the rainy season some bad grass grows under the shade of these trees, and their fallen leaves are eaten in the extremity of hunger. The plantations, therefore, must be considered as one

of the principal parts of the pasture, and amount to no less than 640 square miles. There are 205 miles of high land in clear pasture, but some of this is covered with coarse grass preserved for thatch, by which the pasture is injured. This is quite parched in the dry season, but in the periodical rains gives an abundant supply. Of the hills, perhaps 30 square miles may in the rainy season be covered with a short herbage fit for cattle to eat. Broken corners, banks, burial grounds, roads and barren lands, amount to 417 miles, of which probably near 400 may be covered with a soft herbage that in the rainy season is very productive, and its grass is then carefully cut. In many places this and the mango groves are the only source for green forage: in the dry season they give little or none, but the mango groves in many parts are the only places to which the cattle can be sent for air. It would thus appear, that in the rainy season, there is a tolerable supply for the cattle that are kept, and except then little or no work is performed by the plough, and they in general are then in tolerable condition. In the dry season both the plough cattle and the cows are truly wretched, and are chiefly supported on a little Poyal and Bhusa that each receives morning and evening, and on the stubble of grain, particularly that of rice. Towards the end of the rainy season while much labour is performed, and when the grass begins to fail, they are assisted by the stems of Maize and Janera. The cows that are in full milk are generally allowed some green Janera and Khesari, not indeed in a quantity sufficient to keep them fat, but it enables them to give some milk. The people also collect for them some vetches called Akta (*Vicia sativa*, and an *Ervum* lately mentioned), which grows as weeds among the young wheat.

A very few cows are kept in the house, and regularly fed on Bhusa or cut grass, on which they keep in very good order, and some in addition are allowed oil-cake. Cattle employed to carry loads or in mills are fed in the same manner, and all are allowed cotton-seed or oil-cake, which, when mixed

with Bhusa and water, forms Sani. An ox fed in this manner costs four paysas a day in towns, or half as much in the country; the latter rate is little more than one rupee a month, *i.e.*, 13 rupees a year. The cattle employed to draw carriages, especially those reserved entirely for travelling, are allowed pulse usually of the kinds called Kulthi and Urid. The sour drink prepared from the remains of vegetable food, washings of grain, and water in which grain has been boiled, that in the south of India is given to cattle, is here entirely neglected, which seems a great want of economy. There is no rent exacted for pasture.

Salt is given to cattle as a medicine. The burnings, so freely applied in the south of India, are not here in use. In cold weather, towards the Ganges, the cattle are kept in the house, but in the hot and rainy seasons they are tied to stakes near the houses. In the southern parts of the country they lie out all the year. In the wastes of Nawada and Sheykhpurah there are a few Bathans, where the cattle sleep in the woods surrounded by a hedge of dry thorns; but the number of such is very trifling, and, as I have said, in most parts the people call the mango grove their Bathan, although the cattle remain there only during day.

It is chiefly persons of the Goyala tribe, who carry to pasture the cattle of the village, at least those of rich people; because the children of the poor tend their own herds. The old people and children of the Goyalas tend the cattle, and the women are chiefly employed in collectin and drying the dung for fuel. Near the towns a woman by this employment can make a rupee a month. In country places she may make ten annas. The reward for tending cattle is fully as high as in Bhagalpur. In towns boys or old people that tend cattle may gain 12 annas a month; in the country their gain may be half as much. In the former the price is 2 paysas ($\frac{1}{28}$ part of a rupee) a head; in the latter it is one paysa.

Cattle here are as healthy as in Bhagalpur or in the west of Puraniya.

The profits arising from cows are probably fully as high as those in Puraniya, but enter little into the farmers calculations of profit, as they chiefly save him from the expense of purchasing plough cattle, and bring little actual return into his purse.

Buffaloes are a valuable property. They are good cattle of the kind, and on an average breeding females sell for 26 rupees a pair. In the list of milch buffaloes, the adults have only been included. A third more may be added for the young. The plough buffaloes are mostly males, which by labour are disabled from breeding; and males exempted from labour must be kept for that purpose, but little selection seems to be made. Among the plough buffaloes are some females that have turned out barren. The number wrought seems to increase in proportion to the dryness of the climate. On account of those reserved for ploughing fewer of the calves are destroyed, when young, than in Bhagalpur; but few or none are reared for sacrifice. Some buffaloes are employed to carry home sugarcane and maize from the field.

In these districts almost the whole buffaloes live entirely in the village, and are fed in the same manner as milch cows: that is, they get any pasture which is procurable, and in the dry season are allowed a little Sani and Bhusa at night, and sometimes the Mahuya flowers, from which spirit has been extracted. Those in full milk, towards the end of the rainy season, and in Spring, receive some green Janera and Khesari; but the situation of the greater part is in general truly wretched. In the woods of Nawada are two or three Bathans, where the condition of the buffaloes is throughout the year tolerable. The buffaloes of Duriyapur during a part of the year are kept on the north side of the Ganges.

The price paid for tending buffaloes is usually double of that given for cows, and often quadruple. The following was given in Duriyapur as an estimate of the annual expense attending a herd of female buffaloes, consisting of 100 head, of which 25 are young.

To two keepers at 25 rupees each	R. 50 0 0
To eight month's pasture on the north side of Ganges, at 4½ anas per head on the adults	21 1 0
Green forage purchased while at home	120 0 0
Khari salt, ¼ ser each, three times a year=225 sers	2 4 0
	<hr/> R. 193 5 6
25 are constantly in milk, giving daily in all 100 sers (56 s.w.) for every 12 of which the owner receives 1 ser of ghiu, he therefore gets in all 3041¼ sers (lb. 4372) worth 13 rupees for 48 sers	R. 823 14 4½
Balance	<hr/> R. 630 8 10½

In this district goats are very numerous. There are a few of the long legged kind, mentioned in my account of Bhagalpur, but of a poor ugly breed and kept chiefly as curiosities. The small goat of Bengal is by much the most common, and is exceedingly productive. Here, as in other districts, the chief profit from this stock arises from the males sold for sacrifice or for eating, partly while kids and partly when castrated; but I think that the milk is here somewhat more used and is given to children without preparation.

All the sheep are of the long tailed kind, called here Bhera Bheri, and there is nothing remarkable in the difference between their management here and in the districts before surveyed. It is worthy of remark that the sheep of this breed seem fonder of the leaves of trees than the goats are; just the reverse of what happens in Europe. Vast additions might be made to both the number and productiveness of both the sheep and goats by jujub trees planted in poor soils, as both animals eat the leaves with avidity.

Swine increase in numbers as I advance further to the west. Their mismanagement and abominations are not less remarkable than in Bengal. A considerable number are fattened and salted by an European near Danapur. The natives usually castrate the males and kill them when half grown. The females are reserved for breeding and are seldom killed when old.

Curs and cats abound as elsewhere. Many of the former have much of the greyhound in their shape and are used by the low casts in the chase.

the estate of some large proprietors, who find it impossible to collect their rents, mostly paid by a division of the crop, without farming them; and where rents are farmed, especially to rich, litigious, or violent men, it is impossible altogether to avoid such oppressions, the farmers having no permanent interest in the estate, and being fearless of the law, the delays in which render all precautions in favour of the poorer tenantry perfectly nugatory. This is an additional reason against the practice of letting for such rents; as on any considerable property the frauds, without farming the rents would be altogether insufferable. Some remedy might be afforded to these evils by prohibiting the rents of more than one Mauza from being farmed by one man.

The tenants of these districts are not much afraid of their landlords, but I believe are a good deal attached to their interests, and would willingly join them in any military enterprise where there were hopes of plunder.

The rents here, as well as in Bhagalpur, which are paid in money, are called Nukudi, and those arising from a division of the crop are called Bhauli. Some persons have the whole of their rent Nukudi, others have the whole Bhauli, but in general each person has a share of both.

The Nukudi here is no doubt collected in petty instalments; but a written receipt is almost always delivered at each payment, which is a great preservative from oppression. There are two kinds of Nukudi; one is called Hustbudi, where the land is annually surveyed, and pays so much for each bigah that is cultivated with such or such crops, according to their supposed value. When the annual account is made out, it is in all cases usual to deduct one-tenth of the amount, and when the tenant complains that his crop is bad, the surveyor is employed to examine the field, and to state how much the crop is inferior to what it ought to be, and a proportional allowance is deducted from his rent. This, with all the appearance of fairness, is a very destructive tenure.

as it renders the tenant careless. It is, however, by far the most common. The other means of fixing the rate of rent, called Baharsi, or Thika, is to value the ground according to its quality; and when the tenant enters his farm this is valued according to the rates usual in the vicinity, and he cultivates it in whatever manner he pleases, and pays the rent according to the valuation. This, as I have had repeated occasion to mention, is the tenure by far the most favourable for the improvement of agriculture, and to which every encouragement should be shown.

I have already had occasion to dwell fully on the nature of the rents arising from a division of the crop. The division is so troublesome, that, instead of their respective shares, both master and tenant, when the crop is ripe, usually agree, the one to take and the other to give a certain quantity of grain, or its value in money. For this purpose a surveyor and arbitrator are appointed, who state what ought to be paid. If the tenant is satisfied, he pays this; if he is not satisfied, he stands a division. The valuation in this manner is considered as a favour granted to good tenants, and which cannot be shown to the indolent and necessitous. The landlord, were he to trust them, would receive nothing. His officers must therefore carefully attend at the thrashing floor, and secure his share, before it comes into the clutches of those to whom the tenant is indebted. On small estates the Bataiya is least liable to objections; on large ones it gives rise to so many frauds against the master, that it is scarcely admissible. It seems to be a remain of this custom, that has led to the strange and oppressive custom of fixing the money rents after the crops have approached to maturity, that has been mentioned as existing in some parts of Puraniya. Originally, perhaps, the tenant was bound only to pay a share, and arbitrators were appointed by the Zemindar to put a value on that share, which value the tenant paid, if satisfied. This is quite fair; but, as a means of ascertaining a money rent to be paid during a long lease, it is a most abominable oppression, of which

some traces still remain in these districts, where it once probably was common.

Although the rents here are much higher than towards the east, the people in general are by no means poorer, and in particular they are in much better circumstances than the tenantry in those parts of Bhagalpur and Puraniya that pay next to nothing.

It would seem that formerly the custom of granting leases was more common than at present. In many places the landlords are not willing to give leases, nor would the tenants accept of them. In others a lease has been granted; but when it has expired, it has not been renewed, and the tenants continue to occupy at the same rate, the owner or his clerk writing "It is right" on the back of the lease. In general no attempt has been made to raise the rents; nor could they admit of such a measure, as by far the greater part of the land pays one-half of the produce. Some attempts have been made to raise the money rent, and it is said that two opposite decisions have been given, the judge at Gaya having declared that the landlords might let such lands as were out of lease in whatever manner they pleased; while the judge at Ara declared that only the old rates could be demanded, and the landlords have found it imprudent to insist on the demand. The chief change that seems to be taking place is, that a good deal of land, which formerly paid by a division of crops, has been lately given for a money rent. This is especially going on under the prudent management of Raja Mitrajit, and is one of the greatest improvements that can be effected. Most of the leases have been granted to the chief tenant of the village, with an &c. for the others, and merely state the rates of rent, so that no estimate of the rental could be formed by obtaining all the leases on the estate. In other places each tenant procured a lease (Patta), and gave an agreement (Kubuliat) to pay at the rates specified, for in these leases even the actual sum to be paid is seldom mentioned. In these places new tenants have not of late given the agreement called

Kubuliut; but, in its stead, have given one called Ekrar. Many disputes might be prevented by compelling all tenants to take leases, in which the total demand of the landlord should be specified.

I now proceed to give an account of those who cultivate land in which they have no property. No persons are here hired to cultivate for a share of the crop, as that is the manner in which the tenantry are rewarded for their stock and labour. When treating of the condition of the people, I have already mentioned all that occurs to me concerning the slaves employed in agriculture. It now only, therefore, remains to treat of ploughmen hired by the season, and of day-labourers employed in agriculture. I may, however, premise that the same custom of neighbours uniting to labour alternately on each others fields is here as common as in Bhagalpur, and I am told is common in every part of Bengal, although it there escaped my notice.

The plough-servants (Kaniyas) in these districts are exactly on the same footing with those in the part of Bhagalpur that belonged to Behar, and this has already been fully described. The chief difference that I observed was, that in many places the son was considered bound to repay the money advanced to his father, even should the effects left on the parent's decease be far less in value than his debts. This seems to me an extreme hardship, reducing the whole of this class to a condition little better than that of slavery, and ought to be declared totally illegal. I am assured in some places of the district, that within the memory of man the price necessary to be advanced to servants has doubled. Formerly no one gave more than 20 rupees; now they are content to give 40. This seems in a great measure owing to the increased quantity of money. It certainly cannot here be attributed to the exertions of indigo planters, who in some districts claim the merit of having raised the workmen's wages. In some places the ploughman (Kamiya) receives a small spot of land, from 5 to 20 Kathas ($\frac{3}{20}$ $\frac{1}{20}$ of an acre) of the country measure. This he cultivates with

his master's plough; but finds the seed, and gives his master one-half of the produce, that is, pays the rent. The usual daily allowance, when ploughing, is 3 sers of grain, or in some places from $1\frac{1}{2}$ to 2 Paysas, with $\frac{1}{2}$ ser of the unboiled porridge called Chhattu. It is seldom that in this season they work more than nine hours for their master, and when required to work the whole day, they receive an additional allowance. They seldom, however, at that season earn more; but they do little jobs about their own house, or spot of ground, when they have any. The following was given as an estimate of one's gains in the country part of Pergunah Azimabad, near Patna:—

	Paysas.	Sers Chhattu.	Sers Grain.
182 days ploughing, at 2 Paysas and $\frac{1}{2}$ ser Chhattu	364	91	0
60 days watering, at 3 Paysas and $\frac{1}{2}$ ser Chhattu	180	30	0
45 days reaping	0	0	310
45 days thrashing and cleaning	0	22	40
15 days repairing their master's house	45	0	0
15 days idle.			
Total	589	143	350
		Rs.	A. P.
589 Paysas	...	10	8 3
143 sers (76 s. w.) of unboiled porridge (meal and water) 285 lb. of meal	...	2	2 6
350 sers of coarse grain=682 lbs.	...	4	2 3
Total	Rs.	16	13 0

In order to give an idea of what the labourer may procure for this money, I may observe that each rupee brings about 156 lbs. of maize, or other coarse, but wholesale grain; but no allowance is here made for sickness. A woman, reaping, weeding, and transplanting, makes almost as high wages as the man ploughing. At other times she may generally procure as much by beating rice; but she is liable to more interruptions. She, however, may clear 8 rs.; the man, allowing for sickness, may make 14 rs.; an old person, boy, or girl, able to tend cattle, will make $4\frac{1}{2}$ rs.; total for a small family $26\frac{1}{2}$ rs. If the family exceeds five, there will usually be more workers. I shall give another estimate from Nawada, one of the poorer and least cultivated parts of the district, where the

assessment is low, and where a large proportion of the expense of labour is thrown on the harvest, most of the rent being obtained by a division of the crop.

	Sers Grain.	Sers Chhattu.	Money.
To six months ploughing,	546	91	0 0
To watering one month,	90	15	0 0
To repairing their master's house, one month,	90	15	0 0
To reaping two months, 1-21, bundle, ...	600	0	0 0
Do. Ati,	360	0	0 0
Do. Lara,	1050	0	0 0
To thrashing one month, no allowance, ...	0	0	0 0
One month idle, or cultivating for themselves a plot of about one bigah Calcutta measure, they take one-half of the produce	0	0	1 6½
Total	2736	121	1 6½

The ser weighs only 48 s. w.; so that the grain is 3,371 lb. and the parched meal in the Chhattu or porridge is 149 lb. I have valued the produce of the land in money, at for what one-half of it would sell in harvest. The grain converted into money is worth r. 18-15-4. The parched meal is worth about r. 1-11-8. The total annual gain is therefore 22 rs. 1½ anas; but in that part only small advances, such as two rupees are given without interest, and the woman, while collecting the Lara, can do no other work.

I have already mentioned the reward given to those who tend cattle, which is very high. Day labourers are numerous; and receive nearly the same allowance for common labours, such as weeding, repairing houses and the like, that is given in Bhagalpur; but there are vast numbers employed with the hoe, in transplanting rice, and in watering winter crops, and these receive one-third more grain. In Patna, in place of grain they are paid in money, and in place of three or four sers of grain, get three or four paysas, which will purchase four and-a-half to six sers of the coarse grains, that they use. Notwithstanding the extreme jealousy of the men, the women other day labourers make almost as much as the men, as they are employed to weed and transplant rice, receiving the same allowances as men, and they assist in the harvest.

People of high caste, although they will work on their own farms, at every labour except holding the plough, will not hire themselves as day labourers; but poor people of the cultivating tribes (Chasas) or artificers, do not consider this employment as at all disgraceful, and by its means many small farmers gain a part of their subsistence. I have not heard of any day labourers being here paid in advance.

CHAPTER VIII.

OF ESTATES.

Section 1st: Of estates in general.

In these districts the extent of lands exempted from revenue is enormous, and many of the lots are pretty considerable; but by the rule of succession that has been established, they are fast frittering into petty portions, so that very few of the proprietors live in the splendour of gentlemen; and many of them are more distinguished for silly bigotry and superstition than for learning. A great deal has been alienated from the purposes for which it was granted; but I do not know, whether government, as the law now stands, could altogether resume lands granted for the support of colleges, mosques, temples and tombs that have been allowed to go to ruin, or that were intended for the support of noble families or persons dedicated to religion and learning, when they have been alienated to plebeians or to laymen, or to the vulgar. I presume, however, that the present occupants might be compelled to give a reasonable share of the profits for these purposes. There is also great reason to suspect that many of the occupants have no legal claims of propinquity to those who originally received the grants. On these accounts the whole free lands of Behar, as well as of other districts, would perhaps require investigation. If government is unwilling to incur the suspicion of rapacity, the lands or revenue to be thus recovered might be granted to public institutions for the education of the natives, which are very much wanted and would be very popular, and an agent for the institutions might conduct the recovery.

According to the public records, the whole land that has been measured being 5,520,541 bigahs, and the free land, so far also as it has been

measured, being 1,510,437 bigahs, it forms $37\frac{1}{2}$ per cent. of the whole : nor do I believe that this proportion is materially erroneous as considerable extents of land have not been measured, and probably nearly in the same proportions in both kinds.

I have not exactly learned the nature of the tenures in the parts of these districts, that lately were taken from Shahabad; but I perceive, that almost the whole there belongs to Muhammedans, and this is also the case in the other parts. Indeed there is strong reason to think that almost every grant which the Hindus occupy, has been procured by forgery or other fraud, during the confusion which prevailed on the first occupancy of power by the Company's servants, and that during the Mogul government no grants of land were tolerated for the support of idolatry, or of a pagan priesthood. In the estates which these districts contained, before the annexation of part of Shahabad, the following are the purposes for which the free lands have been granted :

Lodi Khan's bigahs.

1st. Eltugma <i>vulgo</i> Eltunga, lands granted in perpetuity as a reward for splendid military actions, or for the support of a noble family. Registered at	2,82,037	7½
2nd. Jaygir or lands granted to a military officer for the support of his establishment, and only for life; but many claim it in perpetuity, and the claim in some cases is said to have been admitted. It is registered at	2,24,252	10½
3rd. Jaygir Pasban, land granted for the support of watchmen. This is usually paid by the Zemindars, and other landholders; but in some instances the allowance has been made by government. This land of course belongs entirely to the public, and is applicable to the support of the police, and government has a fair claim on the Zemindars, where such lands have not been separated from their estates, to compel them to pay for the support of this establishment. Registered at	428	10
4th. Sershekun is said to be land given to Zemindars, who have been killed in battle fighting for the king. Registered at	44,789	0½
5th. Kharej-Juma, is land allowed free to Zemindars as a reward for services. Registered at	3,54,339	7
6th. Mafi, is land granted to Zemindars, who on account of services were excused from paying their whole assessment. This excuse was usually granted by the king, the Kharej-Juma was usually a grant from a provincial governor. Registered at	26,618	7

Lodi Khan's bigahs.

7th. Nankar, land given to the Zemindars for their maintenance. This ought not to be reckoned free, for as belonging to each estate it forms a part of the security to the public for the payment of the revenue. Registered at	62,138	0
8th. Malekan ought to be a share of the revenue granted to ancient owners of land, when the government chose to take the management into their own hands; but lands free of rent would seem in some cases to have been granted in lieu of their commission. Registered at	2,473	19
9th. Inam or Inamat, land bestowed as a gift. Registered at	3,506	0
10th. Inam Kanungoeyan, land bestowed as a gift on the persons, who kept the records of revenue	400	0
11th. Mududmash, land given to any favourite for his table expenses. Registered at	1,01,267	16
12th. Ayimah Ozzam, land given daily for religious purposes, (kings being held bound to give more or less daily). Registered at	3,06,373	9½
13th. Khayrat, is land granted for the same purpose on extraordinary occasions. Registered at	1,93,040	9
14th. Neyaz-Durgah, land granted to those who perform prayers at tombs. Registered at	853	13
15th. Talok-Durgah, land the property of tombs. Registered at	1,500	0
16th. Brahmottar, is land granted to Brahmans for their support. None such as I am told was ever given by the kings. Registered at	7,948	17
17th. Brahmottar Vishnupriti, land granted to Brahmans for the sake of Vishnu. Registered at	2,181	0
18th. Visnupriti, land granted for the sake of Vishnu. It differs in name alone from the last. Registered at	36,956	17
19th. Sivottar, land granted for the sake of Siva. Registered at	214	16
20th. Khaleslah Shurifah, is a grant, of which I have procured no explanation. Registered at	8,817	18
21st. Musruf, is another similar grant. Registered at	1,250	0

In the review of particular estates, I shall have occasion to show that the quantity actually occupied is probably much greater, but this will serve to show the general proportion of the purposes for which the grants of free land have been made. Many temples have now free lands attached to them and many Hindu priests have considerable possessions; but none such are registered, and the possession is probably quite illegal. It is probable however that it has been lately purchased from the Muhammedans, bestowed by pious Hindus for the support of their own religion, and still retained under the names of the former possessors.

Besides the free lands, the invalid establish-

ment has obtained 24,194 bigahs of their measure, equal to about 47,500 bigahs of Lodi Khan, or 54,400 of the Calcutta standard : the whole belongs to the Zemindars, and has hitherto been a burthen, which has occasioned much ill-will between the parties; it is alleged that the Zemindars have forcibly seized on a part.

The lands in these districts belonging to the invalid establishment are in a much better state than those in Bhagalpur, and the invalids seem more contented, but I have no doubt of the advantages that will result from the change that has taken place in the manner of rewarding the services of these very meritorious persons. The benefits that have arisen from a reasonable assessment in these districts have been extended to the lands of the invalids and those exempted from revenue, which being in general intermixed in small lots amidst the assessed lands, receive all the advantage of the industry which the assessment has created, and are managed in the same manner.

The minute subdivision of property has reduced by far the greater part of the Zemindars to the condition of mere peasants, and many of them could not live decently without cultivating their lands on their own account. I am indeed credibly informed that in some places even this resource is inadequate, and that many of the military Brahmans who have small lots, unwilling to undergo the fatigues of European discipline or to labour for hire, have betaken themselves to absolute begging, and for that purpose make an annual expedition into Bengal, where they pretend to be Gayawal Brahmans. This division of property has however its advantages as well as losses. These small Zemindars are certainly less oppressive to their tenants and more obedient to government, than the greater; but they banish every thing like splendor or learning from the country, and confine its demands entirely to the most simple and rude manufactures, so that they almost entirely exclude commerce; and the litigations to which the sub-

division gives rise, are endless. These losses seem to me to be more than a counterbalance for the advantages, especially as no pains can remedy the evil which the minute subdivision of property occasions, while a firm government and careful administration of justice may in a great measure prevent the evils of large estates. I would earnestly therefore recommend, that landed properties should be made to descend undivided, as they do in most parts of Europe. The natives, I believe, have no prejudices on the subject, and the doctors of their laws are so entirely occupied with the ceremonials of religion, and consider these as of such infinitely greater importance, that they are perfectly prepared and willing to decide in worldly matters according to whatever any government may choose to desire.

The petty landlords of these districts are not called Zemindars, but Maleks, and by far the greater part of them are military Brahmans, and appear to have been the proprietors of the land before the Muhammedan conquest, that is to say, held them by military tenure from the Hindu kings; but whether they held them in perpetuity, is very doubtful; and in all probability the Rayats here, as elsewhere, were the real owners of the land, the military tenant exacting only the land-tax imposed by government. In the Mogul government the Maleks were certainly not officers of government, as the Zemindars undoubtedly were; nor had they in general any management of their lands. An officer of government granted leases, collected the rent, and gave the Malek one-tenth of the neat proceeds. The Malek appointed an accomptant (Screshtahdar) to see that he received his due, and usually received a trifling annual present from the tenants of each village, as an acknowledgment of superiority in the feudal sense. Some chief men, called Kanoongoes and Chaudhuris, had allowances called Nankar and Dustur; the former was a portion of land free of rent, the latter consisted of certain presents given by those who held lands that were exempted from revenue, in lieu of the tenth of the revenue. In

some places, however, it is alleged, that the Maleks managed their own estates, and accounted to the Amel or collector for the whole proceeds, deducting one-tenth of the neat profit for their support. On the settlement made by Lord Cornwallis, most of the Maleks were placed exactly on the footing of Zemindars, although some estates have been granted to other persons, who pay to the Maleks the same allowance that they received in the Mogul government. These estates, in fact, are some which were confirmed to Mogul Zemindars, whose office, owing to their boldness and the weakness of government, had become hereditary; and owing to the former circumstance, these persons drove altogether many of the Maleks, while they retained others, who assisted in their battles as military vassals. Where the estates, either free or assessed, are large, the owners keep establishments, much such as in the districts hitherto surveyed, and according to their rank employ a Dewan or Tahasildar as their steward, with clerks here called Motsuddis or Peshkars, cash keepers (Fotdars), record keepers (Dufturis), guards (Peyadahs), under an officer (Jumadar), &c. These reside at an office (Kachahri), where the rents are collected; but in the whole of these districts the number of such establishments is very small; there may be perhaps 15 or 20. The property indeed has been so much subdivided, that it would be highly oppressive to compel the owners to pay their revenue into the collector's office, as is usually done in Bengal; for, besides the risk, the expense of sending such trifles to a distance would exceed the amount. On this account the collector in several parts of the country has appointed Tahasildars, who receive the land-tax from the petty Zemindars. This I know is attended with abuses, but it must in time extend all over the country, if the present manner of succession to landed property be allowed to subsist.

Small Zemindars keep a clerk, with whose assistance they collect the rents, and they have one or more watchmen (Chaukidars), who give an alarm in case of an attempt at robbery; for most

of the landlords have numerous families, and are both well armed and perfectly able and willing to defend themselves.

The usual village establishment is as follows:—A common agent (Gomashtah) is generally employed to manage from one to five mauzas, whether these belong to one person or to many. He keeps the accounts, and distributes every man his share of the profit, for which arduous task he receives only from 3 to 5 rs. a month; but he is allowed a clerk (Patwari) at from $1\frac{1}{2}$ to 3 rs., and in some places has a commission of from 2 to 4-56ths on the receipts, and in others a fee from the tenant on each annual receipt. This is called Hojjutanah, and usually amounts to 2 paysas, or $\frac{1}{8}$ of a rupee from each man. Both Gomashtahs and Patwaris have almost everywhere illicit gains, which chiefly arise from the division of the crop, they conniving with the tenant against the landlord. I am told that no Patwari, for instance, spends less than 6 or 7 rs. a month. He has also allowed as assistants one or two Barahils, or Gorayits, who watch the crops on the thrashing floor, collect money, and distribute water from the reservoirs and canals. These messengers are allowed each from $1\frac{1}{4}$ to 2 rs. a month. Under the Gomashtah are also one or two Dosads, Chaukidars, Pasbans, or watchmen, who guard his house at night, and in the day collect money. These in some places are allowed each from $\frac{6}{10}$ to 1 bigah of land free of rent, and as much land for rent as can be cultivated with one plough. In other places their allowance of free land is much more considerable, but they have no farm. The people of the villages give them presents, as they visit the whole houses at night, and prevent stealing. This is the whole regular establishment on the part of the owners of land, and amounts to a mere trifle; but, where the money rent is fixed on the kind of crop that is cultivated, or where the division does not actually take place between the landlord and tenant, but the amount to be paid is settled by a kind of arbitration, a survey becomes necessary. The surveyors receive 9 or 10 anas a day for each set

of four or five men; but these value about 50 large bighas a day, so that this expense also is a mere trifle. The usual set employed to make these surveys consists of the following persons:—1st. An Amin, or chief surveyor, at 4 anas a day; 2nd. A Nuvisindah, or clerk, at 2 anas a day; 3rd. A Sales, or mediator between the Amin and tenant at 2 anas a day; 4th. A Juribkas, or person who measures with the rod, at 1 ana a day. Two Juribkases are, however, most usually employed, making in all five persons at 10 anas a day. In some places the tenant gives the whole party food; but in others he feeds only the Sales and Juribkases, through whose favour, he chiefly expects advantage. Notwithstanding this numerous establishment, it is not often that the Amin makes an actual survey. He and his attendants look over each farm with the tenant, and they make a calculation by conjecture of the extent and value of each kind of crop. This is the proper Hustbudi; when an actual measurement takes place, it is properly called Surasuri; but resource is not often had to this troublesome expedient. In some places, where the tenants are not tractable, the surveyor and they pitch upon some plot of each field as being of an average goodness, and this is reaped before the surveyor as a means of determining the whole produce. The Sonar, or goldsmith, called also Hatuya, is likewise an irregular part of the village establishment, being employed to weigh all grain, both at the division of the crops and when any is sold to the trader, either by landlord or tenant. He is often not a goldsmith by profession, and is usually paid by the purchaser at the rate of from 1 ser to $\frac{1}{4}$ ser of the grain on every rupee's worth sold; and on this account his commission is seldom considered as an expense to either landlord or tenant. The hereditary mendicants (birti), which are a burthen on most estates, are usually supported by receiving a portion of the goldsmith's commission, so that their being a burthen on the land usually escapes notice, and in some places they are indeed supported entirely by voluntary contribution, for procuring which they hang on about the thrashing-floors of their respective

villages. They usually spend at the rate of 60 or 70 rs. a year. Most of them are Dihi Brahmans, but some are Dasnami Sannyasis, and few are followers of Nanak. This commission, and the selling much of the grain, when the market is glutted, tends to keep the nominal harvest price at the low rate at which I have stated it in the tables of produce; and in fact a great proportion is sold at that rate, although prudent men receive a much higher.

The chief of each village (Mauza), who is here usually called Mahato, or Jethraiyyat, holds his office by hereditary tenure, and does not league with the owners of the land to oppress the tenants, but in general supports their interests; and, being a wealthy man of some education, assists the poor and illiterate in settling their accompts. In all well-regulated Indian governments this is the proper duty of such persons; and it appears to me that in Bengal these persons might be rendered highly useful by making them entirely independent of the Zemindad, and removeable by government on an application from the majority of the tenants under their protection, whose wishes with regard to the succession should in all cases be supported. At the same time, these chiefs of villages should be secured in all the emoluments which they have hitherto received, and for which most ample deductions were made to the Zemindars at the settlement. On some estates the Mahato is a kind of security for all the tenants, and when one of these goes away, it is he that appoints a new one, the owner of the land giving himself no trouble about the matter.

In most of the larger estates a great proportion of the rents are farmed, which, with the system of letting the lands by a division of the crops, is absolutely necessary to prevent collusion between the tenants and agents of the owners. The same practice prevails also, although not to such an extent, even where the estates are very petty, and where no just cause can be assigned for its continuance. These renters are here called Thikadars, and are quite the same with the Mostajers of the north of Bengal; but in these districts there is a class of men

called Mostajers, who are totally different, and who have lent money to the Zemindars. These have agreed to give them the management of the whole estate as security, and the Mostajer, besides 12 per cent. per annum for his money, takes one half of all the neat proceeds of the estate, until he is repaid. In some parts one-fourth of all the assessed lands is burthened in this manner, and only one half remains in the management of the owners. Few of the Thikadars here are men of power, which renders their yoke less oppressive; and the complaints that I heard were chiefly against those of the tribe of Domkatars among the military Brahmans, who, from having been long the leaders in the anarchy which prevailed before the English government, have acquired a name that still conveys a good deal of terror. The smaller Thikadars require no other establishment than that usually attached to villages as above described; the larger ones require only the addition of one or two clerks and watch-men. They contract to pay a certain sum for a certain number of years, usually from 3 to 10, and defray every expense, even that of forming and repairing the canals and reservoirs, used in watering the land. The former is, of course, generally neglected, and sufficient attention is seldom paid to the latter; and, were there no other, this is a very strong objection to the system.

Although the people of this district are very cautious in speaking of their affairs, it is very generally admitted, even by themselves, that the owners of the assessed lands have very considerable profits; nor do they scruple to admit that it far exceeds the estimate of one-tenth of the revenue, which was supposed to be the profit that they were to have by the settlement. In fact, it in general, I believe, far exceeds the total amount of the revenue. The assessed land has not yet, however, become a very saleable property. Within these five years, the collector of Behar has put up to public sale 77 lots, paying an annual revenue of 33,777rs., and the whole price has been 53,152 rs., and for no less than 10 of the lots no bidder appear-

ed, and the land fell into the Company's hands. This shews that the settlement made by Lord Cornwallis is not a security for even the revenue, which he rendered perpetual. It would not, however, be fair to bring the sales made by the collector as giving a just idea of the value of the assessed lands; because, in making the assessment, and in proportioning subsequent subdivisions, the roguery of some of the persons employed has thrown a heavy part of the assessment on peculiar lands, so that these are no longer worth the possession. Other estates have lost so much from rivers, that they have been reduced to the same state, and it is such land chiefly that is brought to public sale. A gentleman in Patna, who has purchased 10 bigahs of free land for building, told me that with the utmost pains it cost him 2,000 rs.; but it would let at least for 20 rs. a bigah, so that he gave 10 years' purchase; and I am assured that, in that city, most of the assessed land sells very little lower (perhaps one-eighth) than that which is free; for lands that are not over-assessed are seldom brought to public sale, except when some great Zemindar has been entirely ruined by mismanagement, or for the purpose of defrauding creditors.

Section 25: *Of Particular Estates.*

Except one Pergunah named Mulki, the whole belongs to the Mogul territory of Serkar Behar in the province of the same name. Mulki is under the authority of the judge and magistrate of Behar, but pays its revenue to the collector of Tirahut, and seems to have originally been a part of the Serkar or Barony so named; but it is not mentioned in the Ayceen Akbery. Mulki contains about 12 square miles, leaving 534½ for the part of these districts belonging to Serkar Behar. Two measures are almost every where in general use. One by which every one reckons in common affairs, and each pole of which is three Sekunduriguz long, and the bigah is 20 poles (Kathas) each way. The poles, which I have tried, were about eight feet four inches long, more or less, as usually happens owing to the rudeness of the workmen. This common bigah is therefore about 27,779

square feet. But in the revenue accompts another bigah was introduced by a Lodi Khan, when that person estimated the extent of the whole of Serkar Behar. Sixty of the common bigahs, according to the people of the collector's office, are equal to 100 of Lodi Khan, which therefore contains about 16,660 square feet. The reason of the people choosing to reckon by a bigah different from what is used in the public records, is evidently owing to the fear of an actual measurement, as the whole of these districts do not contain near so many customary, bigahs, as are registered, although several very extensive portions have not been measured. Many persons especially those who enjoy free lands, have probably much more than their measurement of Lodi Khan's bigahs; but, if a new measurement were proposed, they would no doubt pretend, that the measure referred to in their grant was that customary in the country. I understand that some of the owners of free land have introduced on their estates a bigah still larger than usual.

1. Pergunah Azimabad comprehends the whole of the city of Patna, the greater part of Phatuha, and a small part of Bakipur Jaywar. In the Ayeen Akbery it is called Patnah (Gladwin's translation), the name Azimabad having not then been invented. According to the public accompts it contains about 1,10,644 bigahs, of which 53,982½ are not passed. According to the space, which it occupies on the map, I calculate, that besides rivers, roads, &c. it contains about 2,27,000 bigahs of Lodi Khan's measure, that is more than double of what it was supposed to do, when assessed. Allowing, that the free and assessed lands have shared equally in the profits, the former will in fact amount to 1,10,800, leaving almost 57,000 bigahs, that might probably be recovered, if the proprietors are entitled to hold no more than the extent mentioned in their grants. And, if the present occupants were allowed to retain this surplus, at the rate laid on what is assessed, they would have little reason to complain. The assessed land in the same manner I calculate at 1,16,700 bigahs, which pay 56,347½

rupees, and are burthened with 1561 bigahs granted to the invalid establishment, and these are equal to about 3000 of Lodi Khan's measurement, nor have they as yet made any considerable return to the landlord. They may therefore be said to pay 56,347½ rs. for 1,13,700 bigahs, or 1,31,600 of the Calcutta measure, of which they have therefore 2 3-10ths. for the rupee. A small portion however, in and round the fort, and consisting chiefly of shops, belongs immediately to the Company, and is farmed out at 2025 rupees a year under the name of Mahal keladari, but this will make little difference on the above calculation. The whole is most completely cultivated, the industry excited by this demand having been sufficient for the purpose. The assessed lands are divided among 84 families, many of which have subdivided into various branches, that still manage their estates in common. Their profit must be very great; 1,31,600 bigahs Calcutta measure are equal to 68,220 of that, by which lands are now usually let; but the lands in the immediate vicinity of Patna, amounting to about 1-6ths. of the whole are let at a money rent of from 5 to 25 rs. a bigah, besides some very high in the chief market places. I do not think, that the average for this part can be taken at less than 12 rs. which will give 120,000 rs. a year. In the more remote parts the land is divided into three kinds, Uprar or high, Diyara or islands, and Tal or inundated. The Uprar amounting to 5-16ths. is all let for money rent, at the following rates; 1st. quality from 3 to 7 rs. a bigah, 2nd. quality from 2 to 3 rs., and 3rd. quality from 1½ to 2 rs. The average of these cannot be short of 3 rs. a bigah, which will give 54,600 rs. The Diyara, amounting to 2-16th. of the whole, is also mostly let for money rent, at 3rs. for the first quality, at 2½ for the 2nd., at 2 rs. for the 3rd., at 1½ for the 4th., at 1 r. for the 5th., at one-half r. for the 6th. and at one-quarter for the 7th. The average may be 1½ r., which will give 10,800 rs. The Tal amounting to 9 anas of the whole, is also let chiefly for a money rent (called here Hust-budi), but some by a division of

the crop. The rate of the former is fixed by the nature of the crop, rice from 3 to 4 rs. wheat $2\frac{1}{2}$ rs. other winter crops 2 rs.; but it is usual to grant a deduction of 10 per cent. on the amount. The crops, which pay by a division, are chiefly pulse, and of little value, so that on the whole the average rate may be $2\frac{1}{2}$ rs. giving in all 81,050 rs. The total gross rental will be about 2,66,000 rs. There are no reservoirs, and only a few canals, the expense of which is very trifling; so that this with all charges of collection cannot exceed 10 per cent., which with the taxes will amount to about 83,000 rs., leaving a neat profit of 1,83,000 rs. Deducting the utmost, that can be allowed for ground given free of rent, for houses, the clear gain will be more than double the revenue. The assessment it must be observed is high, and the tenures good, by far the greater part being let for a fixed money rent, and cultivated in whatever manner the tenant pleases; and scarcely any of the rent is farmed.

2. Pergunah Phulwari (Phoolwari, Glad.) is a fine estate, composing the greater part of Bakipur-Jaywar with a very little scattered in the division of Arwal. In the public accounts it is supposed to contain 68,952 bigahs of Lodi Khan's measurement, of which 25,565 are not assessed. According to my estimate this estate, besides rivers, roads, tanks, canals, broken corners, &c. contains 1,24,100 such bigahs; and, if such be the case, the free land may probably have grown to 46,000, and the assessed may contain 78,000 of such bigahs, which pay annually 39,016 $\frac{1}{2}$ rs. or very nearly 1 r. for 2 Calcutta bigahs, which is a higher rate, than in the immediate vicinity of the town of Patna, with so little regard to equality has the assessment been conducted. It is even alleged, that the free lands actually amount to one-half of the whole. In which case the assessment will be considerably higher. The whole estate is cultivated with the utmost pains, as might be expected. The assessed lands in the public accounts are divided into 70 lots, belonging to a number of Maleks, mostly decent looking peasants. Only

about one-eighth of the land pays a money rent, chiefly the land near the houses occupied with sugarcane, rice, wheat, barley, poppy, cotton, and vegetables. It pays from $1\frac{1}{2}$ to 8 rs. a bigah of the country measure, probably on an average about 3 rs. which will be about 19-16ths rs. for one of the Calcutta standard. The remainder pays by a division of the crop; after deducting the harvest, the master taking nine parts, and the cultivator seven. The average produce of such land may be worth about 3 rs. a Calcutta bigah, deducting $11\frac{1}{2}$ per cent. for the expense of the harvest, there will remain $42\frac{1}{2}$ anas, 9-16ths. of which are equal to very near $1\frac{1}{2}$ r. for rent. Upon the whole the gross rent may be about $1\frac{1}{2}$ r. and the revenue may be one-third of the amount; but besides the expense of collection, usual in the districts hitherto surveyed, the landholders here have had to construct and keep in repair a considerable number of reservoirs and canals, although not so many as in the southern parts of these districts.

3. Pergunah Beliya (Belya, Glad.) in the public accmpts is reckoned to contain 86,009 bigahs of Lodi Khan's measure; but from the space it occupies on the map, I estimate that besides rivers, broken corners, &c., it contains about 172,000. It is situated chiefly in the division of Noubutpur, of which it forms by far the greater part, but some of it is also situated in Jahanabad and Hilsa. According to the public accounts 39,406 bigahs are not assessed, which agrees very well with the proportion stated in the vicinity; and if my estimate of the extent of the estate be right, these in fact amount to about 78,000, leaving 93,200 to bear an assessment of 26,870 R., which is nearly at the rate of 4 Calcutta bigahs for the rupee, or one half of the rate exacted in Phulwari. The assessed lands, according to the public records, are divided among 119 families; but I am told that a great many more enjoy shares of the property than are entered into the collector's papers, and that some petty manors (Mauzas) are divided among 50 proprietors. The confusion is exceedingly increased by the nature of some free land

called Kharij-Juma, which before the settlement was fraudently given to Brahmans, and was taken from the lands of certain Mauzas by those who then held them; but at the settlement the original rent was divided equally upon the lands of all the shares, so that those who had given nothing for the benefit of their souls pay just as much as those who for that purpose had conveyed to the Brahmans a part of their estates. This has occasioned endless disputes. Many of the ancestors of the Maleks have long held these lands. They are all mere peasants and few of them can keep accompts. About $\frac{6}{16}$ pay a money rent, much of which is let on leases of from one to three years, according to a rate which is paid, whether cultivated or not; and both the number of bigahs and amount of rent is specified. The rates are from 4 anas to 2 rupees for the customary bigah, which is at the rate of from $2\frac{1}{10}$ ana to 1 rupee $\frac{3}{4}$ ana for a bigah Calcutta measure; the average probably is about 10 anas. This is for poor land, generally what has been deserted, owing to the tricks of those who farm the rents. The remainder of the money rent is paid for the rich land near the villages called Juma-Dihi, and the leases are in perpetuity, but the rates vary from 1 to 7 R. for the customary bigah, or from $8\frac{7}{10}$ anas to 3 rupees 11 anas for the Calcutta bigah, the average probably being a little more than 2 rupees; $\frac{10}{16}$ of the whole are let by a division of the crop, in some places the master taking $\frac{7}{16}$, in others $\frac{8}{16}$ of the produce, after deducting the expense of harvest. The average rate of produce for a Calcutta bigah in this estate, I have reckoned to be 36 anas. Deducting $11\frac{1}{2}$ per cent. for harvest, the rent by division will in the former case be about 14 anas, in the latter about 16 anas a bigah. These rents and the assessment, being lower than in Phulwari, have reduced the average produce of a bigah to 36 anas, while in the former it was estimated at 54 anas. The two estates are very much intermixed, nor is there any essential difference in their soil. The zemindars are here at a considerable expense for keeping up the reservoirs and canals used for watering the

land and assist those who water gardens with the machinery used in irrigation and by digging wells lined with bricks. These wells cost from 100 to 150 rupees, and in most villages there are from one to three of them.

4. Pergunah Sangra (Sandeh, Glad.) is a fine estate, which, like the former ones, would never appear to have belonged to any one family; and at present, even the assessed land, in the public accounts, is divided into 124 lots, with all the inconveniences attending those in Baliya. In the public accounts it is stated to contain 1,58,578 bigahs, of which no less than 78,146 are exempted from assessment, and the remainder pays to government 24,650 rupees. The greater part is in the division of Helsa, but a considerable share is in the adjacent divisions of Jahanabad and Noubatpur, and a Mauza is scattered in the remote division of Sheykhpurah. According to the space which it occupies on the map, I consider that, besides rivers, broken corners, &c., it contains about 1,77,000 bigahs of Lodi Khan's measure, so that if the measurement on the assessed and free lands is equally defective, the former pay to government at the rate of 1 rupee for 4 bigahs Calcutta measure. There is nothing, so far as I could learn, materially different in the management of this estate from that of Baliya. Like it, in the revenue accounts it is divided into 2 pergunahs, one part of each paying its revenue directly to the collector's office at Patna, while the rents of the other part are paid to a native collector (Tahasildar) in the vicinity. A considerable portion of this Pergunah belongs to Raja Mitrajit, who will be afterwards mentioned.

5. Pergunah Baikunthapur is a small estate on the banks of the Ganges below Phatuha, and in that division. In the Ayeeen Akbery it is not mentioned. In the public documents it is said to contain 4,108 bigahs, nor do I know that it contains actually so much, its appearance being very trifling; 644 are exempted from assessment and the remainder pays 3,005 R., so that 168 bigahs of the Calcutta measure pay 100 Rs. With such a

revenue it is very highly cultivated and very productive. I found the owners the most civil, communicative and intelligent family in these districts, and considering the smallness of their estate, they live in a very decent manner. The farthest I can trace the family is to Bhav Singha, a military Brahman of the Pilichwar tribe, who embraced the faith in order to become register (Kanungoe) of this estate. He, as usual, seems to have acquired the estate by keeping its accompts; and although some of his descendants are said to remain, left this property to his brother Chaturbhuj, who continued a pagan. He was succeeded by Baikuntha his son, and he by his son Jay Singha, who had a son Narayan Datta, who was succeeded by Tek Singha, who has left two sons Udawanta and Moti Singha, now alive. Udawanta manages the whole, and the estate, in the collector's papers, is considered as belonging entirely to him; but the family has divided into several branches and has alienated $\frac{1}{3}$ of the whole to another family of military Brahmans, although no public notice has been taken of the transfer. Moti Singha, his elder brother being sick, not only received me most kindly when I passed a night at his village, but came to me at Phatuha and gave me a very full account of the state of the country. He is an active intelligent man, who can keep accompts in the Hindi character, and has the kind plain manners of a decent farmer. The estate is chiefly of the kind of land called Uprar in my account of the first mentioned Pergunah, and this will show that the landlords have abundant profit, as the 3464 bigahs of Lodi Khan are equal to above 2000 of the customary measure which let, on an average, at 3 rupees.

6. Shahjahanpur is another small estate formed since the time of Akbur and situated almost entirely in the division of Helsa, but a share of a village in Behar belongs to it. In the public records it is stated to contain 57,221 bigahs, of which no less than 56,094 are exempted from revenue. According to its appearance on the map it may contain between 64 and 65 thousand bigahs

of Lodi Khan's measurement, but it will be needless to dwell on the management of the trifle that remains to the state, which pays 1000 rupees a year.

7. Bhimpur (Bheempoor, Glad.) is an estate in several respects similar, and estimated in the public records to contain 66,481 bigahs, of which only 1534 are assessed, pay 1958 rupees and are divided amongst twelve families. The measurement in the public records agrees very well with the extent pointed out on the maps. About $\frac{2}{3}$ are in the division of Helsa, and the remainder is scattered in small portions, chiefly in Bar, but also intermixed with Behar and even Sheykhpurah.

8. Pilich (Peletch, Glad.) is a pretty considerable estate, estimated in the public records to contain 1,21,785 of Lodi Khan's measurement, of which 93,551 bigahs, divided into 52 lots, are assessed at 82,461 rupees, and the remainder is free. According to what was pointed out on the maps, I suppose that, besides hills, roads, rivers, &c., it contains about 1,77,000 bigahs, and the proportion of the assessed land will probably be 1,36,000 bigahs, so that the owners pay 100 Rupees for every 190 Calcutta bigahs. The great mass of the estate is in the division of Helsa, but there is a considerable portion in Behar, and two scattered portions in Jahanabad and Hologunj. About a fourth part may be let for money rent, mostly determined annually according to what is actually cultivated. Sugarcane pays from 4 to 7 rupees a bigah, customary measure; ricinus from 12 to 27 anas; poppy from $3\frac{1}{2}$ to 5 rupees; cotton from 2 to $3\frac{1}{2}$ rupees; Maruya from 2 to 5 rupees; rice from 2 to 5 rupees. The higher rates are those when the crop is full, but the usual deductions are made when there is any deficiency. The remainder pays by a division of the crop, and I am told that the average amount of both kinds of rent may be about 19 rupees for 10 bigahs, equal to $19\frac{1}{3}$ of the Calcutta measure, the assessment to government, on which I have stated at about 10 rupees. The management is nearly the same as in Baliya.

The zemindars have been at a very considerable expense in forming reservoirs, but have not dug many canals. Since the settlement by Mr. Law, the number of reservoirs has been doubled; before that event the estate was as fully occupied as it is now; but owing to the smaller supply of water it was vastly less productive. The zemindars have made a few wells lined with brick for supplying the fields; but, as is the case in most estates, except Baliya, by far the greater part of the wells used for this purpose are not lined, and are dug at the expense of the tenant. Some of the rents are farmed. It must be observed that one of the tribes of military Brahmans derives its name from this estate, and the chief proprietor in this estate is of that tribe and is considered as its chief. His name is Hariprasad Singha, son of Nischal Singha, son of Datta Singha, son of Raghubar Singha, son of Chaudhuri Dhir Singha, son of Prawal Singha, and it is supposed that 10 ancestors in a direct line preceded this chief in the enjoyment of these lands.

9. Geyaspur (Ghiasspoor, Glad.) is a very great estate, comprehending almost the whole of Bar, a very large share of Duriyapur, a considerable portion of Hellsa, and a small part of Phatuha, all along the banks of the Ganges; and in the interior it has a great deal in Sheykhpurah, and a little in Behar. In the revenue accoupts it is stated to contain 4,60,586 bigahs of assessed land, and 2,26,737 bigahs that are free. It is alleged, that the river has made considerable encroachments, and from the appearance of what it would appear to occupy on the maps, I can scarcely think that it contains more than the records state. The assessed land pays only 83,887 rs. a year; but it has been burthened with 5,559 bigahs for the invalid establishment, equal to about 10,800 of Lodi Khan's measure. Deducting these, as having hitherto produced little or nothing to the proprietors, they will have 62 bigahs Calcutta measure for 10 rs. Owing to this assessment, it is not so fully occupied, as the estates hitherto described; the cultivation is careless, a good deal of pulse being

sown in the mud without ploughing; and the average produce of a Calcutta bigah is not estimated at above 2 r. 12 a. It is divided into 212 lots, the owners of which as usual are called Maleks, and are mostly military Brahmans, whose families claim possession for many ages, and who are a bold turbulent race of men. I am assured by a venerable invalid officer, that when he first received land, a great part of the vicinity was waste, and infested with the tiger, rhinoceros, and elephant. These destructive animals have since been banished, and all near the Ganges has been entirely cleared; but in the interior, owing to the lowness of the assessment, there is still some waste, and the cultivation is careless, nor has any considerable number of reservoirs been constructed for watering the land. The same officer informed me, that near the river no land was let for less than 1 r. and much brought three times that sum for the customary bigah, which is at the rate of from 8 1-3rd anas to 25 8-10ths anas for the bigah of the Calcutta measure. The lands there liable to inundation, and sown without cultivation, are mostly let by a division of the crop, and produce a trifle; where regularly cultivated, they rent almost as high as the elevated banks of the Ganges. The leases are from five to nine years, but the tenants pretend, that they must be renewed on the same terms. It is however said, that Mr. Smith, lately judge of the district, gave a decision to the contrary; and, as I have said, it is highly expedient, that such should be established as the law. Scarcely any of the rents are farmed; and it is owing to this probably, to the high rents, and to little of the rent being paid by a division of the crop, that the estate is in such a good condition; for the assessment is much too low.

10. Sulimabad has been mentioned in my account of Bhagalpur, which contains a part of this estate, and I need not therefore enter into a farther discussion. The assessed part of the portion of this estate that these districts contain has not been measured, but so far as I can judge by its appearance on the map, the whole may amount to

94,000 bigahs of Lodi Khan's measurement. Of these 3,581 are not assessed and the invalid establishment has 6,560 of its bigahs, equal to about 12,750 of Lodi Khan. The lands, therefore, which have hitherto borne the assessment of 12,086 rupees, provided the owners of free estates hold no more than their due, amount to about 78,700 of these bigahs, so that the owners have 65 Calcutta bigahs for 10 rupees. This portion, according to the public records, is divided into 59 lots

11. Pergunah Besowak (Beesook, Glad.) is a fine estate, the greater part of which is situated in the division of Behar, but a very considerable portion also is situated in Holasgunj and a little in Helsa. In the public records it is stated to contain 1,00,583 bigahs free of revenue, and only 79,151 of assessed, which pay 61,994 rupees, and are divided into 57 lots. According to the space which this estate would seem to occupy on the map, it may probably in fact contain 2,19,000 bigahs, of which the assessed part will be about 97,000 bigahs of Lodi Khan, so that the owners have only about 19 Calcutta bigahs for 10 rupees. Of course the whole is fully occupied and much attention has been paid to irrigation. The management is similar to that in Haveli Behar which will be next mentioned.

12. Haveli-Bihar (Bahar, Glad.) is a very fine estate, situated chiefly in the division of the same name; but it has also a considerable portion of Sheykhpurah, some in Bar, and a trifle in Helsa. In the public records no estimate is to be found of the extent of its assessed lands; but it contains 32,955 bigahs, which pay no revenue. So far as I can judge from the extent of the map, it would appear in all to contain 2,05,000 of Lodi Khan's bigahs; and, allowing that the proprietors of the free lands may in reality occupy 40,000, the assessed will be 1,65,000, which pay 80,164 rs. so that the owners have 238 Calcutta bigahs for 100 rs. The assessed part is divided into 174 lots; but many of the Maleks have lost the management of their estates, and receive from the present

Zemindars or from the occupants of free land one-tenth of the neat proceeds. Very little of the rent is farmed; three-quarters of the rent are paid in money, one-quarter by a division of the crop. The leases specify the number of bigahs, and the rate, that is to be paid, the money not being fixed, by what is called Hust-budi, while the landlord in the division of crops takes nine-sixteenths of the produce. The leases are seldom renewed, so that the tenants are moveable at will; but this is seldom attempted, nor has the rate been of late raised; six-sixteenths have been added to the cultivation since the settlement; and many reservoirs having been formed, the crops have become more valuable. The rates are as follows:—

1. Transplanted rice from 2 to 6 rs. a customary bigah.
2. Broadcast rice, 2 to 3 rs.
3. Maruya, 3 to 5 rs.
4. Milet and maize, 2 to 4 rs.
5. Kodo, 1 to $1\frac{1}{2}$ rs.
6. Sugar cane, 5 to 13 rs.
7. Poppy alone 5 to 17 rs.

The rate by the Calcutta bigah is rather more than half the above, and I was assured by a man, who had 49 bigahs customary measure, that this rent came to 225 rs. a year, which is at the rate of 2 rs. 6 a. for the Calcutta bigah. The average produce of a Calcutta bigah is valued at 3 rs. 12 a. which, compared with the produce of the low assessed estate of Geyaspur, will show the loss which the country sustains by a too low assessment. The tenants also near Behar, I will venture to say, are less necessitous than in most parts of these districts, three-fourths of them paying their rent from their own stock, and selling their produce at favourable seasons, which will raise the value of the average produce at least one-fourth part. The Mohato, whose farm contained 49 bigahs, as above mentioned, said that his landlord had five-sevenths, and he had two-sevenths of the neat proceeds, that is, he had a clear profit of 90 rs.

13. Best-hazari or the 20,000 is a fine estate, which formerly belonged to the Gidhaur Rajas, and was their favourite residence. Like the other parts of the Gidhaur possessions it is not mentioned in the Ayeen Akbery, having probably been

independent when that book was composed. After the defeat of Kasemali this part of their estate was given in Jaygir to Shahbaz Beg Khan, an officer who had sided with the English. He, as usual, took the estate into his own management and allowed the Raja merely $\frac{1}{10}$ of the neat proceeds; and so little were the Zemindars then regarded, that this Muhammedan, as a matter of course, took possession of the Raja's house, and the officers who have been sent to manage the estate have ever since continued to live in it. In the account of Bhagalpur I have mentioned the attempts which this person made to secure the whole of the Raja's estate, and in fact he held it for his life; but on his decease the Raja obtained the restoration of a part, and the heirs of Shah-baz, retained Best-hazari as a maintenance (Eltumga). The Raja's people pretend that the original grant was a Jaygir, in which case it should have been extinguished by the death of Shah-baz; and it is also pretended that the term Eltumga has been fraudently introduced into the public records. Indeed, such a grant, in the present times, is perhaps contrary to the statute law. On the death of Shah-baz it would however appear that no claim was made on the part of government, and his heirs were allowed to dispute the property, which was claimed both by his widow and by his brother's son. The point of law, it is said, was referred to three Kazis who, as scandal usually reports, took a bribe of 60,000 rupees, and decided in favour of Bahadur Beg, the nephew. Little attention is to be paid to such scandalous reports, to the raising of which the natives are beyond measure addicted. Bahadur left three sons and a daughter, each of whom has received a share which, as usual, has occasioned repeated law suits. The estate, from its appearance on the maps, besides hills, roads, &c., contains about 1,87,000 of Lodi Khan's measurement, and is very much neglected; $\frac{1}{8}$ part of the arable land is supposed to be unoccupied, and very few reservoirs have been made for watering the fields. The produce therefore is small and I was assured that the gross

rental does not exceed 70,000 R. a year. The proprietors reside at Patna, and are probably much defrauded by their stewards.

14. Maldeh (Maldah, Glad.) is a large estate chiefly situated in the division of Sheykhpurah, but a small portion is in Behar. In the public records it is stated to contain 1,03,664 bigahs of assessed, and 20,486 bigahs of free lands, but from the space which it would seem to occupy on the map, it perhaps amounts to 319,000 bigahs of Lodi Khan, of which the assessed part in the above proportion will be about 2,66,000 bigahs, and this paying only 30,950 rupees, the owners have 9,965 bigahs for 1000 rupees. There is very great reason to suspect, not only that the estimates of the extent given by Lodi Khan were framed by mere conjecture and influenced by favour, but that in the records the numbers undergo changes. In the Tahasildar's accounts at Sheykhpurah, for instance, Maldeh is reckoned to contain 1,27,349 bigahs, while, as I have said, in the Collector's books it is stated to contain only 1,24,150 bigahs. Owing to the lowness of the assessment, at least $\frac{1}{3}$ of the arable lands are waste, and there are many superfluous plantations of mango trees, while the cultivation is careless and the crops poor. It is said that the whole of this estate at one time belonged to a Raja of the Goyala tribe, who had under him as vassals several persons of his own cast, and others who were military Brahmans. A Brahman of this kind, of the Bathan tribe, expelled these Goyalas, and had also sundry other estates, especially Siyur in Ramgar, which his descendants still retain. In the reign of Aurungzebe a certain Nuraon Khan came into Behar from Tilawandi in the Punjab, where his ancestors had long resided. They were originally Rajputs of the Mayi tribe, on which account, even after their conversion, they retained the name of Mayi. Nuraon Khan, on his arrival in Behar, entered into the service of the Subah at Patna, and some time afterwards was put to death. He left two sons, Azmeri and Deyanut Khans, who, entering into the service of one of the Bathan

Brahmans, farmed from him the rents of this estate. Soon after, being bold men, fit for thriving in troublous times, they refused payment of their engagements and obtained an order from the Subah to collect the revenues of six pergunahs, agreeing to pay for these a certain fixed rent (Tahud). On this they dismissed the old Zemindars and even many of the Maleks who would not support them in their violence. When Furrokh Shah came to Patna he confirmed these men in the full management (Zemindary) of these six Pergunahs. Azmeri died without issue. His brother Deyanut left five sons, Dalel, Namdar, Serdar, Kamgar and Ranamasra. Dalel the eldest separated himself from his brothers, and obtained a share of the family estates, procuring a grant in the name of his son Purhez Khan. This person had two sons, Kader Bukhsh and Hemmutzuman. Kader Bukhsh had a son named Imam Bukhsh, whose son Tajali now possesses a part of Samya that will be afterwards mentioned. Hemmutzuman's son is still alive, and enjoys also a part of his grandfather's share of the Mayis estates. The four younger sons of Deyanut Khan joined their property. Although Namdar the eldest and his son Wares were successively called the head of the family, and everything was done in their name, yet the whole management was vested in Kamgar Khan, a very bold and turbulent man, who, having obtained from Alum Shah the title of Raja for his nephew Wares, waged war with his neighbours and seized on many other estates. He probably would have seized on the whole southern parts of Behar, had he not been opposed by Sundar Singha of Tikari, who seized on the western parts, while Kamgar seized on the east. Neither seems to have paid any revenue except when an army came to enforce the demand. When this army was sufficiently strong, the Mayi chiefs fled to the hills, and placed garrisons in numerous mud forts, which they defended until a composition was made, and immediately on the army's retiring, returned to their usual practices. When Kasem Ali quarrelled with the English, a

Gurgin Khan in the service of the former joined the Europeans. On this occasion Kasem Ali sent to Kamgar 3 laks of rupees and requested that he would destroy his faithless servant. This the Mayi readily undertook, and with ten or twelve thousand ruffians that he usually employed, advanced to attack Gurgin. It is however alleged that the two forces came to a sudden agreement, and although for decency's sake they had occasional skirmishes, they avoided doing each other any harm further than by occasionally allowing some of their followers to cut each other's throats. The chiefs probably reconciled this to their consciences by considering that most of their followers were deserving of such an end. About this time, it is said, several Europeans fell into Kamgar's hands and that he was ordered by Kasem Ali to put them to death; but this he declined. He still however pretended to adhere to Kasem Ali, but kept aloof at the battles of Giriya and Baksar. This last being decisive, Kamgar waited on the officer commanding the British and presented to him the Europeans whom he had saved, and was not molested in his estates. But soon after he died. Wares, the head of the family, died without sons, and was succeeded by Eckbal Ali Khan, the son of Kamgar, then a boy 13 years old, who besides Maldeh, held Narhat, Samya, Rajagriha, Roh, Jurrat and Pangchrukhi, with a large portion of Amrathu and Maher, and several detached villages in these districts, and also very extensive estates which now belong to the district of Ramgar. This unfortunate boy was placed under the management of two favourite servants of his father, Razali and Sahebabad, men of the old school, not at all adapted to the vigor of the Company's government. It is supposed that, being discontented at the state of inactivity to which this reduced them and instigated by a circular letter from Chet Singha, Raja of Banaras, they rose with some of their old adherents, and having met an European gentleman travelling between Ramgar and Behar, put him to death. No one joining their standard, Razali absconded, but his more bold associate placed his young master at

the head of about 5000 of the old adherents of the family, and marched to oppose a company of seapoys that had been sent to seize the murderers. The first volley dispersed this rabble, but the youth escaped, and went to Dilli. The king gave him a letter of recommendation to Mr. Hastings, representing that the Raja was very young, and had been entirely led by those who had charge of his education, and who had in fact committed the crime. The family alleges that Mr. Hastings, when he received the letter, was just about to embark for Europe, but gave verbal orders that the young man should be pardoned, and he went to reside at his house. The estates on his flight had been seized and the rents farmed to Thikadars, who at the settlement, for what reason I know not, were confirmed as the proprietors of the land, although they are still called renters in perpetuity (Mokurruri-Thikadars). Many of the original proprietors or Maleks had indeed disappeared, and it might have been very proper to have given the lands of such to any person who could manage the estate; but many of the Maleks still remain, and the revenue has been burthened, not only with the support of the Thikadar, but with that of these Maleks, who had of all others the best claim to enjoy the land. Many allege that some at least of these Thikadars have obtained no regular grant, and that their lands might be legally resumed; and if the family representations are true, justice would seem to require that this should be done. Where the original Maleks remain, they ought undoubtedly to obtain the lands; where the Maleks have become extinct, the lands so recovered should be given to the Mayi family; but the assessment being vastly too low, it ought to be increased, so as to prove a stimulus to industry and care. Akburali, some time after his return was brought to a trial for the murder of the gentleman, but was acquitted. He died about nine years ago and left only one son named Hammutali, a lad about 14 years of age and of illegitimate birth. He is supported by a lady of the family who resides at Hasuya, the house of his father. There is another lady of the family who

resides in the town of Behar. The two have a small zemindary which pays 1400 R. a year to government, and receive a pension of 75 R. a month.

A family of considerable note has obtained a portion of this estate of Maldeh, which in the revenue accompts is said to contain 6,104 bigahs, and pays annually 2,833 Rupees. It is by far the best part of the estate, and is in the immediate vicinity of Sheykhpurah. This land was first obtained by a saint named Mukhdum Shah, a son of the holy family of Maner, and has become subdivided into many branches in the male and female lines. The head of the family, in the direct male line possesses only $\frac{1}{8}$ of the whole, and is named Haydurali, the son of Sudur Jah, son of Abdul Rahim, son of Abdul Hulim, son of Yasin, son of Burhum, son of Abdul Bahal, son of Fukhuruddin, son of Firoz, son of Nesamuddin, son of Mazuffur, son of the saint. The family was formerly allowed an annual deduction from the rent of 401 R. in order to keep up the tomb of their great ancestor, which was much venerated by the Moslems of the vicinity; but a collector having stopt this allowance, a complaint was made to the judge, who gave a decision in favour of the family. Notwithstanding family pride and self interest should have united these men in the care of their ancestor's tomb, yet such are the consequences arising from the mode of succession established, that no avail has been taken of this decision, to do which a petition must be presented to the board of revenue. No one member of the family will do this, lest the others should benefit by his exertions; much less can the whole be induced to join in any one undertaking.

15. Narhat (Narhut, Glad.) is a very great estate which was seized by the Mayi family. In the public records it is stated to contain 4,50,407 of Lodi Khan's bigahs; but from the appearance it makes on the map, besides hills, rivers, broken corners, &c. I think it probably contains 6,12,000 bigahs. The recorded free land amounts to 53,487 bigahs, and according to this proportion, the assessed land, if I am right in my conjecture, will

in reality be about 5,39,000 bigahs, so that the revenue being 59,045 R., the owners have about 9 Calcutta bigahs for the rupee. It is of course much neglected, and it was estimated in the vicinity that $\frac{3}{11}$ of the whole arable lands are lying waste, and since the settlement the progress of cultivation has been slow, not above an eighth part having been added to the land then occupied. The average value of the produce of a Calcutta bigah is about 2 $\frac{3}{4}$ Rupees at the harvest price. Before the Mayi family seized on this estate, it belonged to three families of military Brahmans, and the principal family had subdivided into five branches. Since the fall of the Mayis it has been divided among perpetual renters, and subdivided even in the public records into 138 lots, and since the settlement many of the original shares have divided into four or five portions. Seven-eighths of the rent are paid by a division of the crops, chiefly of the kind called Danabundi. Very few of the rents are farmed. Formerly the leases were only granted to a chief tenant (Mohato) with an &ca. for all the others, but since the settlement each new tenant has received a separate lease; when, however, any of these have expired, they have not been renewed. The older tenants gave an acknowledgment (Kubuliut) for their rent; of late they have given an agreement (Ekrar). I do not know exactly the difference in which these two technical terms are taken in Muhammedan law. By far the greatest part of this estate is situated in the division of Nawada, but a considerable portion also is in Sahebgunj, and some parts are in Sheykhpurah, Bar and Holasgunj.

16. Samya (Samaey, Glad.) is a very large estate, which was seized by the Mayi family, and by far the largest portion of it is in the division of Nawada; but it extends a considerable way into Sheykhpurah, and contains a small portion of Behar and Holasgunj. In the public records it is stated to contain 3,32,334 bigahs of Lodi Khan, of which 76,749 are exempted from assessment. From the space which it occupies on the map, I think that besides hills, rivers, &c. it may contain in all

5,34,000 of Lodi Khan's bigahs, the assessed part of which, in the proportion stated in the records, will be about 4,10,000 bigahs; so that, the revenue being 43,087 rupees, the owners have 95 bigahs Calcutta measure for 10 rupees. The state, condition and management differ in no material respect from those of Narhat. It is rather better occupied, $\frac{2}{11}$ only being reckoned waste. Before it was seized by the Mayis, it belonged to a family of military Brahmans, chiefs of the Subarniya tribe. Some branches of the family still remain. On the forfeiture of the Mayis it was granted to many perpetual renters, and in the public records is divided into 96 lots.

17. and 18. The two estates called Rajagriha (Rajgurh, Glad.) and Amrathu (Amruthu, Glad.) have in the public records been intermixed, and then separated into the possessions of Muhammed Yahi Khan, who has obtained a lease in perpetuity of all Rajagriha and a part of Amrathu, while the remainder of Amrathu that pays revenue, retains the name, and is divided into nine petty lots, for by far the greater part of it is not assessed. In the public records the estate of Muhammed Yahi is stated to contain 1,14,485 of Lodi Khan's bigahs, of which only 3,342 are exempted from revenue, and the remainder pays 26,002 rupees. The remainder of Amrathu, according to the same authority, consists of 1,35,316 bigahs, of which only 16,340 are assessed and pay 4,564½ rupees a year. According to the space which these two estates occupy on the map, I reckon, that Rajagriha contains 44,000 and Amrathu 2,78,000 bigahs, besides hills, roads, rivers, &c.; but not being aware of the nature of the division in the collector's office, when on the spot, I cannot conjecture how much of the excess belongs to each division. The level part of Rajagriha is in a state very similar to that of Haveli Behar, from whence we may conjecture that a great part of the revenue that Muhammed Yahi pays falls on this share of his estate. It would appear that a family of Pengwar Rajputs held this estate before it was seized by the Mayi, and some of them still remain. It is situated entirely in the

division of Behar. The great estate of Amrathu, which pays next to nothing for the support of government, is situated entirely in the division of Sheykhpurah. It was there reckoned that $\frac{1}{5}$ of the arable land is waste, but from what I saw, I should judge the proportion to be much greater. This estate, before the Mayi seized part of it, belonged to the owners of Maldeh, but their rivals of Tikari would for some time seem to have held a part, which is that probably which now belongs to Muhammed Yahi. After the forfeiture, a great part of its assessed lands was annexed to Rajagriha and, as I have already mentioned, was given to a Muhammedan family. The present occupant is Muhammed Yahi, the son of Ali Kasem, whose brother Ebrahim Ali had the title of Nawab and was governor of Banaras.

19. Roh (Rowh, Glad.) is another estate that was seized by the Mayi, and which is situated almost entirely in the division of Nawada, but a small portion is in that of Sheykhpurah. In the public records it is reckoned to contain 1,06,681 bigahs, of which 97,119 pay an assessment of 17,105 rupees, and are divided into 42 lots, according to the space it seems to occupy on the map; it probably, besides hills &c., contains 1,70,000 of Lodi Khan's bigahs, dividing which in the proportions stated in the public records, the assessed lands will amount to about 1,54,000 of these bigahs, and the owners have 10 Calcutta bigahs for the rupee. This rate of assessment has produced much neglect, and in the vicinity it is reckoned that $\frac{2}{3}$ of the arable lands are waste. In other respects it does not differ much from the neighbouring estates Samya and Narhat. Before it fell into the hands of the Mayi it was subdivided among many petty landholders (Malcks) of different tribes. It has since been granted to many renters in perpetuity.

20. Jurrah (Sehreh, Glad.) is a very similar estate entirely situated in the division of Nawada. In the public records it is stated to contain 1,13,468 of Lodi Khan's bigahs, of which 77,549 pay to government 9,542 rupees. I think it probable that it may contain 1,50,000 bigahs, the assessed

share of which in the above proportion will be about 1,02,000 bigahs, so that the owners have about 12 Calcutta bigahs for the rupee, and in the vicinity it is reckoned that $\frac{2}{5}$ are waste. This estate, before it was seized by the Mayi family, belonged to Udawanta Singha, a Pengwar Rajput, whose ancestors had held it for some time. A descendant in the fifth degree remains as a peasant on the estate of his ancestors, which is now held by 45 families of renters in perpetuity.

21. Pangchrukhi (Punderuck, Glad.) is an estate very much intermixed with Roh, nor is its boundary towards Ramgar known with any exactness, that part being of little or no value. It is entirely situated in the division of Nawada, and in the public records is stated to contain 53,372 bigahs, of which 44,075 are assessed at 8836 rupees. Besides a very extensive hilly tract containing quarries of mica, I reckon, from its appearance on the map, that it may contain 1,05,000 bigahs fit for the plough. The share of this belonging to the assessed lands, according to the proportion in the public records, will be about 86,000 of Lodi Khan's bigahs, so that the owners have about 11 Calcutta bigahs for the rupee. The management does not materially differ from that of the above estates by which it is surrounded, and about $\frac{2}{5}$ of the whole arable land is waste. Before the Mayi obtained possession, it belonged in chief to the family of Bathan Brahmans who owned Maldeh, and into whose service the first Mayis entered. At present it is divided into 35 lots, mostly held by the renters in perpetuity, but two of them belong to chiefs of the Bhungihars, who held as vassals under the military Brahmans, but are probably descended of the aboriginal Lords of the country, have the title of Tikayits and call themselves princes of the race of the sun (Suryabangsi Rajputs). One is Buniyad Singha of Pangchrukhi, the other Brajamohan Singha of Dubaur. They are both very civil peasants but were so much alarmed that I could procure no account of their pedigree.

22. Maher (Mekur, Glad.) is the last estate which belonged to the Mayi family that I shall

mention. In the public records the estate is reckoned to contain 3,47,828 bigahs, of which 3,00,126 pay a revenue of 52,015 rupees. Part of this estate is however in the district of Ramgar, but as both pay their revenue to the collector of Behar, he does not know what proportion belongs to each district. To judge from tracing the estate on the map, I imagine that the portion of it contained in the district of Behar, besides hills and rivers, broken corners, &c., contains 4,84,000 of Lodi Khan's measurement, almost entirely situated in the division of Sahebgunj, with a very small portion in Nawada. I cannot, as I have above mentioned, state exactly what portion of the assessment falls on this, but it must be very trifling in proportion to the immense size of the estate, a large proportion of which is of course waste, although a great deal of it belongs to Raja Mitrajit, a very active and intelligent landlord. He has no doubt reclaimed much that was formerly waste, as have also some rich convents of Sannyasis that have considerable shares of this estate; but as part belonged to the Mayi and part to the Tikari family, the whole almost, when taken possession of by the English, had been reduced to a waste by the unceasing feuds of these turbulent chiefs. The share that belonged to the Mayi family has been as usual subdivided among several petty renters in perpetuity.

23. The Tikari Raja has a principal share in several estates, but how much I could not learn, as the whole of his affairs are managed with much secrecy. The Tikari Rajas are military Brahmans, chiefs of the Domkatar tribe. Until lately, the family seems to have been in great obscurity, from the time of the Muhammedan conquest at least. Vir Saha was the first person who obtained a small zemindary about the time when the Mogul government first began to decay. His son, Sundar, was contemporary with Khamgar Khan of the Mayi family, and being a person of similar manners, active, bold, valliant, faithless, and cruel, he succeeded equally in these turbulent times, and acquired a still more valuable estate, consisting of

Ukri, Sanwat, Ikil, Bhelawar, Dakhnar, Angtri, and Pahara, with a part of Amrathu, which has been since lost, and a part of Maher still retained, and some scattered portions of other estates, all in the district of Behar, and several other estates in Ramgar. The family however had granted small parts of these estates to vassals or kinsmen, who supported this power, and these at this settlement were entirely alienated, and rendered independent. On the contrary the present owner, Raja Mitrajit, has made considerable additions by purchase. Sundar Saha lived much in the same manner as his adversary Kamgar, seizing on all lands within his reach, plundering those who would not join his standard, and paying nothing to government without being compelled by an army. He obtained the title of Raja from Muhammed Shah, and was assassinated by a Muhammedan servant named Goylamgous, the captain of his guard (Jumadar). Sundar left three sons, Buniyad, Futch, and Nehal Singhas, the last of whom revenged his father's death by killing the murderer. Buniyad succeeded as Raja, and seems to have been a quiet man, and wrote to the English, promising obedience. This letter, it is said, fell into the hands of Kasem Ali, who having summoned the Raja to Patna put him to death, with his two brothers, and Tilak the son of an uncle. A few days before this event the wife of Buniyad had been delivered of a son, named Mitrajit. Kasem Ali, hearing of this, sent a party to kill the infant; but the mother, having intelligence of their approach, put her child in a basket, and having covered him with the cakes of cow dugh that are used for fuel, gave him in charge to a poor old woman, who passed unnoticed with the basket, and delivered Mitrajit to his father's chief officer, Dalel Singha. This person proved faithful, and retired to a fort near the hills, until the battle of Baksar, after which he presented his young charge to the commanding officer. Mitrajit, while young, lived much under the protection of some military officers of rank, and seems to have a sincere regard for the English nation. According to the family account, when Shetab Ray obtained

the management of Behar, he sent inspectors (Amels), who allowed nothing whatever to the Raja, having trumped up false accounts, by which they made the Raja their debtor, and although they had the whole management of the estate, obtained a decree of the courts to seize even his private fortune for the arrears of revenue. This continued, until some time after Mr. Law was appointed Collector of Behar, when Raja Mitrajit was restored to his estates; but they were long disputed by the claim of a kinsman, named Pitambar Singha, now a very old man. The property was finally confirmed to Mitrajit by a decision of the king in council. Pitambar Singha has several estates, which he had probably received as an appanage, but I could not learn his pedigree, the whole affairs of this family being most carefully concealed. Mitrajit is a very prudent active man, and is supposed, besides his purchases, to have accumulate vast wealth; for, although on public occasions he makes a considerable show, in private he is said to be very frugal. Although he has two sons by his wife, it is generally supposed, that he will leave the greater part of his estates and wealth to a son, whom he has had by a Muhammedan girl, and who has been brought up in that faith. The Hindu sons are not brought into company, or rather are entirely kept out of it, while the young Moslem on all occasions accompanies his father. He is a very well behaved young man.

Perhaps 15 anas of all the Raja's estates are let by an actual division of the crop, without employing people to value it, so that leases are of little value, as they extend only to that which pays a money rent, and this is generally confined to a small space round each vilage, that is watered from wells. The leases that have been granted have never been renewed, and most have been addressed to some chief tenant with an &c. for the others. As it would be impossible for the Raja to superintend such a collection, without suffering the most enormous losses, he has farmed out the greater part of his rents, and this has given rise to considerable complaints of oppression; nor is the

cultivation on his estates so good as might have been expected, from the money he has expended in constructing reservoirs, canals and roads. Had his estates been let for a money rent, it might, with his prudence, have been managed entirely by his stewards without loss, and the tenants would have had no cause for complaint, while the rent would have been a stimulus to industry; nor is there the smallest reason to think, that the Raja is in the least inclined to oppress his own tenants.

Having premised so much in a general manner, I proceed to particulars, and begin with Pergunah Ukri (Owkehry, Gohkery, Glad.) situated chiefly in the divisions of Jahanabad and Holasgunj, with a small portion in Helsa, and one of the richest parts of the Raja's estates; but besides what he retains, 78 persons have small lots which mostly belonged to former vassals of the family. In the public records it is stated to contain 1,22,232 of Lodi Khan's bigahs, of which 86,384 are assessed and pay 57,116 rupees. From its appearance on the map, I think that, besides hills, roads, &c., this estate may contain 169,000 bigahs, the assessed share of which in the above proportion will be 1,19,000 bigahs, so that the owners have about 24 Calcutta bigahs for 10 rupees. It is very fully occupied.

24. Ikil (Eykel, Glad.) is a similar estate, situated mostly in the division of Jahanabad, with a little in Holasgunj. Besides Mitrajit, 111 small proprietors have shares in the assessed parts. In the public records it is stated to contain 1,86,997 of Lodi Khan's measure, of which 1,62,385 are assessed, and pay 74,359 rupees. From its appearance on the map I conjecture that it may contain 2,10,000 bigahs, of which the assessed proportion, calculated as usual, will be 1,82,000, so that the owners have about 28 Calcutta bigahs for 10 rupees. This also is very fully occupied.

25. Bhelawar (Behlawer, Glad.) is another very similar estate, which belongs to Raja Mitrajit with 56 small proprietors of assessed lands, and partly situated in Jahanabad, partly in Holasgunj. In the public records it is stated to contain 1,04,212

of Lodi Khan's bigahs, of which 76,913 are assessed, and pay 47,248 rupees. According to the appearance on the map, I conjecture that it may contain 1,24,000 bigahs, the assessed proportion of which will be about 92,000, so that the owners have about 224 Calcutta bigahs for 100 rupees. This estate is very fully occupied. Great pains have been taken in supplying this estate, and the two last with water, both by canals and reservoirs, owing to which the average produce of a Calcutta bigah at harvest price may be valued at $3\frac{1}{4}$ rupees; deduct $\frac{1}{10}$ for harvest and take one half for the proprietor's share, and the gross rental of 100 bigahs will be about 186 rupees. Deduct 10 per cent. for charges of collection; the neat rental will be 165 rupees: the revenue at the highest rate will be about $44\frac{1}{2}$ rupees.

26. Sanwat (Sunnote, Glad.) is a very large estate, situated mostly in the division of Sahebgunj; but it contains also a large proportion of Holasgunj and a little of Jahanabad. In this is situated Tikari, where Mitrajit resides, and only nine petty landlords share in the assessed lands, which in the public records are stated at 3,19,153 bigahs of Lodi Khan's measurement, and pay a revenue of 1,10,852 rupees. The free lands, according to the same authority, amount to 30,578 bigahs. From the appearance on the map this estate probably contains about 3,62,000 bigahs of Lodi Khan, of which the assessed proportion will be about 3,30,000. The owners therefore will have 345 Calcutta bigahs for the 100 rupees. To judge from what I saw, perhaps $\frac{1}{8}$ of what is fit for the plough may be waste; but the profit must be very great, as much pains has been bestowed on its irrigation, and the average of the crops is fully as high as in the three last mentioned estates.

27. Dakhnar (Dhiker, Glad.) is a small estate, situated entirely in the division of Sahebgunj, and the assessed part almost entirely belongs to Raja Mitrajit, there being only one other person who has a petty share. In the public records it is estimated to contain 18,884 of Lodi Khan's bigahs, of which 15,644 are assessed, and pay 5726 rupees.

From its appearance on the map it does not contain more than 20,000 bigahs well occupied. The proportion of this that is assessed may be 16,600, so that the owners have about 334 Calcutta bigahs for 100 rupees. Its state does not differ materially from that of Sanwat.

28. Angtri (Untery, Glad.) is a small estate in the N.E. corner of the division of Sahebgunj, situated between the two chains of the Rajagriha hills. In the public records it is estimated to contain 35,380 of Lodi Khan's bigahs, of which 35,001 are assessed, and belong entirely to Mitrajit, paying 4,371 rupees. So far as I can judge from the appearance on the map, the level arable part of this district is scarcely so extensive as the statement in the public record, and it is very much neglected, as the owner at the rate stated in the records has 936 bigahs for 100 rupees, so that, though a great deal is waste, he has much profit.

29. Pahara (Pahra, Glad.) is a very fine estate in the division of Sahebgunj, of which Mitrajit possesses all the assessed part except five small lots. In the public records it is estimated to contain 1,48,226 bigahs of Lodi Khan's measurement, of which 1,38,857 are assessed, and pay 26,995 rupees. From the appearance on the map, besides rocks, hills, &c. it may contain 1,70,000 bigahs, of which the assessed share may be 1,59,000, and the owners may have about 69 Calcutta bigahs for 10 rupees. A considerable proportion of the arable land is waste, the poorer portions being neglected.

30. Kabar (Kaber, Glad.) is a very fine estate, adjacent to Pahara on the north side, and situated entirely in the division of Sahebgunj. Mitrajit possesses a part, which I believe he has acquired by purchase, but the assessed lands are divided into 49 lots. In the public records it is stated to contain 1,01,699 bigahs, of which 95,405 are assessed, and pay 45,744 rupees. From the appearance on the map it may contain 1,24,000 bigahs, of which the assessed part may be 1,16,000: so that the owners have about 29 Calcutta bigahs for 10 rupees. Its state nearly resembles that of Sanwat, only it is more fully occupied.

31. Dadar (Dawer, Glad.) is an estate adjoining to Kabar, of which Mitrajit has acquired a share by purchase, and in which the whole assessed lands have been divided into 29 lots. In the public records it is stated to contain 39,111 bigahs, of which 38,082 are assessed, paying to government 14,086 rupees. From its appearance on the map it may contain 46,000 bigahs, of which the assessed part will be about 45,000, so that the owners have about 369 Calcutta bigahs for 100 Rupees. Its state is nearly the same with that of Kabar.

32. Gaya Manpur (Giya, Glad.) is a small estate including the town of Gaya, and in the public records is said to contain 3,930 bigahs, of which 140 are free, and the remainder pays 515 rupees. It is divided into two lots, one belonging to Raja Mitrajit, the other to a Gayawal Brahman, named Saharchand Chaudhuri, son of Amirchand, son of Sahebram, son of Susar, son of Suryamal, son of Ratnamal, son of Bangsagopal, son of Gumbuz Ray. It is supposed that many ancestors preceded him in the possession of this estate, but their names are not known. He states the following account of his property. The total extent is 4,484 bigahs, which show that Lodi Khan in his measurement included only arable land, as this is more than the whole land on record, and Saharchand pays only 364 rupees of the assessment; 1700 bigahs are hills, 700 rivers, 600 town, 100 roads, broken corners, &c., 360 free land, 624 bigahs European houses and gardens, 320 fields. It must be observed that in both shares 140 bigahs only are legally exempted from revenue, but that in this one share 360 are now claimed as free and admitted to be such by the Zemindar. In fact he has probably granted them to himself. The houses in the town pay no ground rent, but whenever a house is sold, the Zemindar gets $\frac{1}{8}$ of the price, from which his chief profit is derived.

33. The last estate, that until lately belonged to these districts, is Telarha (Telladeh, Glad.), which contains a great proportion of the divisions of Holasgunj and Helsa, with a good deal in Behar and a little in Jahanabad, being in the richest part

of the whole country. In the public records it is estimated to contain 1,90,171 of Lodi Khan's bigahs, of which 1,51,854 are assessed, and pay 72,701 rupees. The whole belongs to Muhammed Bakur Khan, a sister's son of Serajuddoulah, formerly Viceroy of Bengal and Behar. He does not hold this estate under the denomination of Zemindar, but by a grant of perpetuity. I believe that he is burthened with about 3,000 rupees more than the assessment, which is given to the old owners of the soil (Maleks). He lives in considerable splendour and is fond of frequenting the company of Europeans with whom he eats. From the space which this estate occupies in the map, I conjecture that, besides rivers, roads, &c., it may contain 2,66,000 bigahs of Lodi Khan, the assessed proportion of which will be about 2,12,000 bigahs, so that the owner has about 338 bigahs for 100 rupees. The state, manner of management and profits are nearly the same as in the adjacent estates of Ukri Ikil and Bhelawar, belonging to Raja Mitrajit, to which I may therefore refer. The customary rod used on this estate is $\frac{1}{4}$ cubit shorter than usual in Behar, but this will affect none of the statements that I have made in treating of the above mentioned properties.

These are the estates which were contained in the districts of the city of Patna and Behar when I commenced the survey. The following have since been added.

34. Arwal (Arwel, Glad.) is a fine estate mostly situated in the division of the same name, but partly also in that of Daudnagar. The free lands that have been measured are estimated in the public records at 17,255 bigahs, but lands to the annual value of 12,92,220 dams have also been granted free of assessment. If these have been valued at the same rate with the assessed land, they should amount to 83,000 bigahs. The whole of the free land is divided into 52 lots, but even the persons registered as owners of these lots amount to 139, and it is probable that the owners in reality are twice that number. The assessed lands, according to the public registers, amount to

1,77,036 bigahs, which pay 49,500 rupees, and are divided into 62 lots belonging to 148 persons that are registered, besides 3 lots that are at present in the Company's hands, as no one would bid for them when brought to sale for the arrears of rent, owing probably to an unequal assessment. In the whole estate, from its appearance on the map, besides rivers, barren lands, roads, &c., I reckon that there are 3,81,644 of Lodi Khan, the assessed proportion of which will be 2,43,000, so that the owners on an average have 569 Calcutta bigahs for the 100 rupees; but the assessment has probably been very unequally distributed, as some lots are not saleable. Owing to the lowness of the assessment about one quarter part is waste. This estate seems originally to have belonged to Raja Kangchan, a military Brahman of the Atharba tribe. He was succeeded by Gandharba Saha, the son of his brother Ajub, who was succeeded by his brother's son, Bharath Saha, who left the estate to his nephew, Bahadur Saha. Then came his nephew Bhagawanta Singha, who was followed by his brother Jaswant Singha, whose widow is the present owner. Nephew (Bhatija) in the above account is taken in a very indefinite sense for a kinsman. She is a woman 50 years old, expensive in her habits and involved in debt. She is particularly fond of travelling, and in the dry season lives much in tents, with which she is very well provided. She keeps six horses, two camels and several carts for conveying her baggage. About 100 of her relations live at her expense, and she has in her family about an equal number of domestic slaves. She has rather more than one half (91,000 bigahs according to the register) of all the assessed lands in this estate, and a considerable portion of the rest. Besides this, several of those who have small lots in perpetuity pay her a commission, as being the original owner (Malek). Raja Mirtrajit has purchased a share, estimated in the public records to contain 14,418 bigahs. The only land which pays a money rent consists of the spots near the villages that are watered from wells. All the remainder is rented by a division of the

crop, the landlord and tenant taking equal shares, after deducting the expense of harvest, and the value is settled by a survey; but the people here, being uncommonly litigious, the tenant and surveyor seldom agree, and a plot of each crop is usually reaped, and the produce taken as an average for the whole. The landlords are not willing to give leases nor, for what reasons I did not learn, would the tenants accept of this security for their possessions. Six sixteenths of the rents are farmed. The average produce is about $3\frac{1}{4}$ rupees for the Calcutta bigah, so that, were the whole cultivated, the profits of the owners would be very good.

35. Masaura is another fine estate which originally belonged to the same family. It is mostly situated in the division of Vikram, but a considerable portion is in that of Arwal. In the public records it is estimated to contain 1,81,377 bigahs, of which 1,70,427 are assessed, and pay 38,793 rupees. From the appearances on the map I should judge, that the whole extent will be about 2,27,000 of Lodi Khan's measurement, of which the assessed part may be about 2,14,000 bigahs, so that the owners have about 639 Calcutta bigahs for the 100rs. The part in Vikram division is very fully occupied, that in Arwal is rather neglected. The Rani of Jaswant, whose name on account of her sex it would be considered as disrespectful to mention, has a large share, reckoned in the public records at 59,353 bigahs, for which she pays 12,347 rs.

The Rani has two public offices for collecting her rents, one for Masaura is under the management of a kinsman, who conducts all her affairs, and is called a Tahasildar. Under him is a Dewan at 10rs. a month; five clerks (Matsuddis) at 5rs. each; one valuer of money at 5rs.; one Jumadar or chief guard at 4rs.; 30 Peyadahs or common guards at 2 or 3rs.; one record keeper (Dufturi) at 5rs.; one sweeper has 10 bigahs of land, or about $1\frac{1}{4}$ r. a month. For Arwal pergunah she keeps one Tahasildar or steward at 20rs. a month; three clerks at 5rs. each; one cash keeper at 5rs.; one

chief guard at 4rs.; ten or twelve guards at from 2 to 3rs. Besides this, owing to the unusual litigiousness of this part of the district, she has two agents (Vakils) at Gaya, who have 20rs. a month; an agent with the collector 10rs.; two agents at Patna for the Court of Appeal, one of whom has a salary of 5rs. and the other is paid by a commission on each suit. These are public agents known to the native officers of the courts, and called Vakils, but she keeps agents of another kind called Mokhtars or attorneys, two at Gaya, and two at Patna, each receiving 5rs. a month. Although, as I have said, the Rani is in debt, I am told, that she has purchased a part of Maner; but this does not appear on the public records, the purchase having been made in some other person's name, probably as a resource, should she involve herself so, that her proper estates must be brought to sale. It is not unlikely, that the debts were contracted in order to make these purchases, which she has probably given to her own relations at the expense of her husband's estate. Giribaradhari an Atharba Brahman probably of the same family, has a considerable share of this estate, estimated in the public records at 10,740 bigahs; and he seems to be a person of some note, as his family has intermarriages with the Raja of Betiya; and the Raja of Parsa, when I was at the place, had come to marry a daughter with a numerous attendance, and great tumult.

In all, the assessed lands have been divided into 62 lots, and 130 persons are mentioned in the public records as being owners, but I am told that in fact some Mauzas are actually frittered into 100 shares; two lots besides have fallen to the Company. The free lands, registered at 10,950 bigahs, have been divided into 36 lots, and the registered owners are 96.

In these two Pergunahs of Arwal and Masaura a considerable deduction from the lands occupied by the owners has hitherto been made, but I cannot state how much has fallen on each estate, because in the public records the lands thus deducted from each is not stated, but it has been owing to

this deduction probably that the estates are not in so bad a condition as might have been expected from the lowness of the assessment. The deduction consists of 10,513 bigahs taken for the invalid establishment, and amounting to above 23,000 of the Calcutta standard.

36. Maner (Mynerwa, Glad.) is a very rich estate, composing the whole of division Sherpur, and 2-3rds. of Vikram. In the public records it is stated to contain 1,83,451 of Lodi Khan's bigahs, of which 1,23,865 are assessed, and pay 64,098rs. The assessed part has been divided into 237 shares, and the registered proprietors amount to 458. The free land, stated in the public records to be 59,586 bigahs, is divided into 164 lots, and the registered owners are 358. So far as I can judge from the appearance on the map, it contains 2,70,000 of Lodi Khan's bigahs, the assessed proportion of which will be 1,82,000, so that the owners have about 33 Calcutta bigahs for 10rs. It is very fully cultivated. The parts which are nearest the Ganges, and which compose the division of Sherpur, consist of two descriptions of land, Dihi or high land near the river, and Baharsi or low inundated land at a distance from the bank. The former which produces crops similar to the high lands adjacent to Patna, is chiefly let for a money rent; a little of this is of the kind called Hustbudi, in which the maximum alone is fixed in the leases, and a deduction is made when the crops fail; but the rent in the greater part of the leases is called Harghasi, and is fixed. Most of the leases have expired, and it is said, that the judge of Shahabad has decided, that the tenants have a right to occupy in perpetuity at the same rate. This would appear to be in direct opposition to a decision given in the courts at Gaya; which would seem to show, that the law on this point is not very clear. The following are the usual rates of rent, for such land :

First quality, from 4 to 8 rs.

= $33\frac{18}{100}$ anas to $66\frac{36}{100}$ anas.

Second ditto,

$3\frac{1}{2}$ rs. = 29 anas.

Third ditto,

3 rs. = $24\frac{82}{100}$ anas.

The lands in the inundated part are mostly let by a division of the crops. The average produce high and low is worth $3\frac{3}{4}$ rs. a bigah. Scarcely any of the rents are farmed.

In the interior the country is mostly cultivated with rice, almost all of which pays rent by a division of the crops, and it is only the fields adjacent to the villages, that pay a money rent; one-fourth part of the rents are farmed, and the produce of a Calcutta bigah is estimated at $3\frac{1}{4}$ rs.

I shall conclude with three estates belonging entirely to the division of Daudnagar, which seem at one time to have belonged to a Deldeler Khan, but a Muhammedan chief named Daud Khan, who appears to have been a person of some consequence, took them from Deldeler, and gave them to a dependent of his own named Abutorab. At the same time, by far the greater proportion of these estates were conferred on this favourite free of assessment. Soon afterwards Abutorab bestowed on his patron most of the free lands, the greater part of which his descendants enjoy. Abutorab was succeeded in the assessed part by Abutaleb and he by Golam Kader. His son was Naserullah, and his Raja Golam Gous, who left a son named Zulfekar, now alive. A great part of the assessed estate was granted in Jaygir to the family of Daud Khan, who allowed commission (Malekan) only to the descendants of Abutorab. Zulfekar has alienated by sale almost the whole of what he had, and even his commission as Zemindar has gone.

Daud Khan was of the noble tribe of Koresh, to which the prophet belonged, and it is alleged by his family that at different times he was Subah or Governor of Kasmir, Gujjarat, Bengal, Behar, Sindiya, Sirhind, &c.; but this is somewhat apocryphal. When Governor of Behar he built the town of Daudnagar and placed in it a colony of people brought from Dilli. His son, Humid Khan was a Resalahdar (Aid du camp) of Aurungzebe. His son Zebun Khan held the same office under Furrokh Shah. A certain Raja Kummuruddin, having rebelled, Zebun was sent to reduce him, and was killed in battle. He left two sons, who

divided the estate equally. The eldest, named Humid, was a Resalashdar of Mahummed Shah. He left one son, Shaykh Khayerullah, who was for some time a Resalahdar of the same prince, and was afterwards Governor of Silhat. He left five sons, 1st Asudullah, who died without children, but a lady remains, who calls herself his widow, although her claim to this title is disputed; 2nd. Ekramullah, who died leaving a son named Hoseyn Kuli, now about 30 years old; 3rd. Mohebali Khan, who died leaving a son, Imam Ali, now (1812) 25 years old; 4th, Ruhullah Khan, now alive; 5th. Rahimullah, now alive. The Jaygirs of Ekramullah and Mohebali have been resumed, although the family alleges that the grant is in perpetuity. The second son of Zebun Khan was Ahamud Khan, who was a Resalahdar of Shujaudaulah, and was killed in an engagement with the English near Patna, a little before the battle of Baksar. He left three sons, 1st. Golam Gous, who died leaving a widow; 2nd. Haydur Kuli, who also died leaving a widow; 3rd. Kasem Ali, an infirm old man. Two persons seem to have received shares of this estate, namely Baninur, the mother of Golam Gous, and Hoseynullah, the son of Velayetullah Khan, probably by a daughter of the family, but these shares also have been resumed. The whole lands of this family are free. Part of it was given as Inam or Eltunga and pays nothing; part was Jaygir and pays commission to the original proprietors. All of the family that I saw were very civil persons but much reduced in their circumstances by the subdivision of their property, and by anticipation, which has induced them to farm their rents to their creditors, by whom their tenants have been harassed. In the public records I can trace that the heirs of the elder son of Zebun Khan still retain in their names between 50 and 60 thousand bigahs of registered free land, and the widow of Golam Gous has 14,000, but I cannot trace the remainder. It is said that when the settlement was made, one half was waste. Since that, Manourah has been pretty fully occupied, but

owing to the lowness of the assessment Inchha and Goh have been rather neglected. A fourth part of the land is let for a money rent on leases called Mamulipattahs, and are generally granted to the head tenant of each Mauza with an &c. for the remainder. These leases are from 5 to 10 years, but are not always renewed when they expire. The rent is fixed according to the soil, in whatever manner it is cultivated, and no deduction is allowed for bad years, but a deduction of 1/10 is always granted. The rates are as follows.

	for the customary bigah	for the Calcutta bigah
1st. quality	5 rupees	41½ anas
2nd. do.	4 do.	33 1/10 anas.
3rd. do.	3 do.	28 9/10 do.
4th. do.	2 do.	16 6/10 do.

Most of the rent paid in kind is taken by an actual division of the crop, so that annual surveys are not necessary. Seven-eighths of the whole rents are farmed and complaints exist that the farmers are oppressive. The number of reservoirs is not at all adequate for the proper irrigation of the land, but the best lands only being occupied, the average produce of a Calcutta bigah is about 3½ rupees at the harvest value. I now proceed to treat of the remainder of these three estates.

37. Inchha (Unjha, Glad.) in the public records is stated to contain 1,03,044 bigahs, of which 30,670 only are assessed, and pay 6,782 rupees. According to the space which it occupies on the map, it should contain 47,000 of Lodi Khan's bigahs, the assessed proportion of which will be about 43,000, so that the owners have about 6½ Calcutta bigahs for the rupee. This low assessment and the vast extent of free land, much mismanaged, occasion one third, it is supposed, to be waste. The assessed land is divided into 32 lots and the registered owners are only 38. The free lands are divided into 16 lots among 47 registered owners.

38. Goh (Kouh, Glad.) is an estate nearly similar to Inchha. In the public records it is estimated to contain 1,14,372 bigahs, of which 41,453

only are assessed and pay 6,030 rupees. From its appearance on the map I think that it may contain 1,32,000 of Lodi Khan's bigahs, of which the assessed part will be about 48,000, so that the owners have about 9 Calcutta bigahs for the rupee. About one fifth is waste. The assessed land is divided into 39 lots, the registered owners on which are 63. The free lands are divided into seven lots, occupied by 12 registered proprietors.

39. Manourah (Menerwa, Glad.) in the public records is stated to contain 87,975 bigahs, of which 54,153 are assessed, and pay 22,492 rupees. According to its appearance on the map I suppose that it contains about 1,03,000 of Lodi Khan's bigahs, the assessed part of which will be about 63,000, so that the owners have about $3\frac{2}{3}$ Calcutta bigahs for the rupee. About one-eighth only is reckoned waste, including rivers, roads and broken corners. The assessed land is divided into 42 lots, the registered owners in which are 81. The free land consists of nine lots, the registered owners in which are 12.

BOOK V.
OF THE STATE OF ARTS AND COMMERCE.

DIVISION 1ST. OF THE ARTS.

CHAPTER 1st. OF THE FINE ARTS.

1. In the account of the topography and condition of the people, all that I have to offer concerning the state of architecture, ancient and modern, has been nearly anticipated. Some of the architects who were brought from Jaynagar to construct the temple of Vishnupad, at Gaya, still remain in this town, and possess some science. In the account of the building, I have already described its curious structure; and it is to be regretted that the subdivision of property, and other circumstances, have prevented the Hindus of these districts from employing these workmen in the line of their elegant art, for they are very capable both of planning and executing buildings that would be highly ornamental. Tekchand, the chief artist, says that he has six books treating of his profession. These books which are composed in the Hindi dialect, with a very great intermixture of Sangskrita, are attributed to Viswakarma, the god of artists; and the following account of them is taken from what Tekchand says. 1st. Khengranawe, in 18,000 couplets (slokas), gives an account of the manner of constructing houses and temples, and of ascertaining the fortunate times for laying their foundation. 2nd. Kesraj, in 3,000 couplets, gives an account of images. 3rd. Prasadmandal is a large work; but Tekchand possesses only 500 couplets. It treats on the various forms of temples. 4th. Rupmandal is also a large work, of which Tekchand possesses only a fragment. It treats on the form of images. 5th. Vastusastra, in 2,000 couplets, gives an account of the forms of houses. 6th. Rajballabh, in 1,400 couplets, treats of the same subject.

From the above list of books, it will appear that the same artists are architects and statuaries;

and, in fact, they have made a few images, at Gaya, of very fine white marble brought from the west of India. In this art they are very inferior to their proficiency in architecture; and they are now little, if at all, employed in this line. The present inhabitants, when they wish for an image, take any one that comes first to hand, in a ruin, and in the selection they pay little or no regard either to sex or attributes. Many of these old images are in a better style than any I have yet seen in India, except one or two at Mahabalipura, near Madras; but they are very far indeed removed from European ideas of perfection. The images made of clay, used so commonly in Bengal, are not in fashion in Behar, except with the few Bengalese settlers in Patna.

The painters (Mosouwer) possess a good deal more merit than those in the districts hitherto surveyed, although they are as far behind Europeans as the statuaries are. They have many sets of miniatures representing the princes of the house of Timur, and, especially in the minute attention to various parts of dress, these are well executed. They also sell various groups, representing Indian scenes and customs, in which some attention is even shewn to exhibit the effects of light and shade; but I suspect that they are copied from the drawing of some persons who have been acting under European guidance, and that they could not make any new drawing in which attention was paid to these circumstances. They are all Hindus, and are very superior workmen to the painters that were employed in the palaces of Tippoo Sultan. An inferior description of painters are at Patna, called Nukkash. They entirely resemble in their style the daubers of Puraniya, but are much employed to disfigure the walls of the galleries in front of the houses, that serve as shops, or for receiving strangers.

Music, in respect to quantify, is on a very thriving footing. The wives of the men, who beat the Nahabat, are in general the Mirasins, and are much employed. Some of them are called Rajpatras, and are of a dignity superior to the

common. There are five or six girls in each set, part singing and dancing, and part performing on musical instruments. A set receives from 2 to 10 rs. for an evening's performance, and their songs are chiefly of an amatory nature. At Patna five sets of the dancing girls called Bai have considerable celebrity, and are considered by the natives as very accomplished. Two of them are Hindus, and three Moslems. Mahtab, the chief singer in one of the former, is in the highest request. Like the others, she usually goes to Calcutta during the Durgapuja; and, when she first appeared, being about 15 years of age, she had 1,000 rs. for the three nights' performance! She is now about 36 years of age, and her price is reduced to 700 rs., her personal charms having had as much influence as her voice or motions. On ordinary occasions, at Patna, these good sets are usually paid 15 rs. for a night's performance. The lowest sets are allowed 5 rs. Those in the country are inferior. Two sets at Gaya receive 10 R. a night, but the ordinary nightly hire of the sets in the country is from 5 to 3 rupees.

Bai, it must be observed, although in common use, is rather a degrading title, and is only given with propriety to upstart sets, who are also sometimes called Natin. There are others, who have been continued by adoption for a long period, and whose predecessors obtained a certain rank from former princes. Some of them, if not all, were allowed small endowments in land, which in the S.E. part of these districts a few still retain. These enobled ladies of easy virtue and enticing manner were, by imperial authority, reduced to four classes, Domni, Hurkini, Kangchani and Ramjani: the last are Hindus; the three first are Muhammedans.

None of the regular sets of dancing boys, called Bhakliyas have a fixed residence here; but many come from Benares to celebrate the Holi. It was only in Jahanabad that I heard of a few sets of weaver boys who acknowledged the name of Natuya and danced and sung for hire, as in Bhagalpur and Puraniya. Some boys however,

of various casts, and some even of pure birth, dress themselves like Bhaktiyas and during the month Chaitra dance and sing in honour of Radha and Krishna; but they perform only before the friends of their parents and do not receive hire. Very few are employed to sing the praises of either gods or saints. The most numerous class is called Kalawangt or Dharhi, and are Moslems. They sing however not only the praises of the saints, but those also of Radha and Krishna. One or two men sing in company and at the same time play on a kind of guitar (Tambura).

The Kathaks are Hindus, who go in sets of three or four, and sing accompanied by the same kind of guitar, by a violin (saranggi), by cymbals (mangjira) and a small drum (dholak). The boys, who at Banares are bred to dance, are said to belong to this cast, but the people here deny the connection, which they consider disgraceful. The Kathaks celebrate chiefly Radha and Krishna by singing the Git-Govinda, but they also sing many common songs, and as they often visit Bengal, many of them have acquired the love ditties of that country. They are considered as different from the Akras of Bengal.

The set of Yajaks, consisting of five or six barbers, are chiefly employed at funerals, and the divine love of Krishna and Radha is the only subject which they choose for this solemnity.

The Bhajaniyas of these districts are the same with the Bhajaniya Kirtaniyas of Puraniya. They are chiefly employed at the entertainments which the Brahmans give when any occasion of mourning is at an end.

I refer to my account of Puraniya for an account of the Tasawalehs, Pangchbajaniyas and Nahabatwalehs. Many religious establishments, Hindu as well as Moslem, have now usurped the latter mark of grandeur.

The Roshunchouki are musicians who are employed chiefly at marriages to perform on fifes and drums, not exactly resembling those of Europe, but liker these than any other instruments that I know. They are also employed at the pro-

cessions in the Mohurram. From five to seven performers are in a set and receive from 1 to 1½ R. a day, with food.

The Daphalis have been mentioned in my account of Bhagalpur. Besides being Moslems, they differ from the Katthaks in performing without being ordered and in trusting for payment to their skill, or rather importunity.

The Bakhos are a set of beggars resembling the Daphalis.

The Pawangriyas are sets of poor or lazy Muhammedan men and women, who infest the houses in which marriages or births have taken place, and sing until a bribe closes their mouths.

I have in former districts mentioned the Hijras among the beggars, and they are in fact such; but they beg exactly in the same manner as the Pawangriyas, only that they are eunuchs, and are supposed, when young, to be guilty of illicit gain.

At marriage ceremonies, women of character sing, those of rank assembling in their own houses, and the poor walking in procession; but the performance on any musical instrument, or dancing, would be considered as highly indecorous.

In the country, few men are guilty of the indecency of singing or performing on musical instruments; but in Patna and Gaya many wealthy people indulge themselves, the young, worldly and giddy youth singing love songs openly and without shame, while men of learning and sanctified birth sing hymns. Rama and Krishna, however, even with these are the favourite themes, and these deities were not ascetic.

CHAPTER II

OF COMMON ARTISTS

Section 1st: *Of artists employed about the Persons of the Natives, or working in perishable Materials.*—Few of the washermen are here Muhammedans. They are not so poor as in Puraniya or Bhagalpur, and in general live better than common labourers; and many who are employed to bleach the finer cloths make good wages; for instance, in the Company's factory at Jahanabad, 75 men are employed. They receive from the factory soap, soda, lime, and the requisite implements, and are allowed $1\frac{1}{8}$ rs. for bleaching a score of pieces (28 to the score), 40 cubits long by 2 broad. The cloth is fine calico of a close fabric, and is boiled, steamed, and smoothed by beating it with a beetle (mungri) on a smooth plank. Four men usually work in company, and on an average bleach four score a month; so that each earns $19\frac{1}{2}$ rs. a year. Their women wash the clothes of the people in the vicinity, and may earn 12 rs. a year. The whole expense of bleaching one score=560 yards, are as follows:—

To washerman's hire, 1 r. 10 anas; to $4\frac{1}{2}$ sers ($9\frac{1}{2}$ lbs.) of soap, 12 anas; to soda, 6 pices; to lime, 9 pices:—2 rs. 7 anas, 3 pices.

The washerman furnishes fuel, which he gathers. In the division of Arwal, where the Company has some cloth bleached, the washermen in a similar manner are allowed a certain sum for the score of 28 pieces, according to the size; and the agent furnishes soap, lime, and soda, while the washerman's wife collects the fuel, and is said to do no other work. The larger pieces (barabana), which are 22 yards long by 2 cubits wide, cost 2 rs. $5\frac{1}{4}$ anas for the workman, 13 anas' worth of soap, $\frac{1}{2}$ ana's worth of soda, and $\frac{3}{4}$ ana's worth of lime. Total expense for bleaching 28 large pieces=3 rs. 3 anas, 6 pices. The washerman usually washes this quantity every month, so that the whole of his and his wife's earnings in the year is 1 ana short

of 28 rs.; the pay being higher than at Jahanabad renders them less industrious.

At the Company's factory, again, at Behar, each man and his wife usually work together, and in a month wash 2 bales (bokchas), each containing 35 pieces, nearly of the same size with the pieces at Jahanabad, but rather longer and narrower. The allowance is from $1\frac{3}{4}$ to 2 rs. a bale, but the bleacher finds fuel, lime, and soda, the two former of which he must purchase. The bleachers, therefore, make about $3\frac{3}{4}$ rs. a month, from which about half a rupee must be deducted, for what they purchase, leaving 39 rs. for their yearly gain. The expense of bleaching the bale including soap is about $2\frac{4}{16}$ rs.

Soap is here made to a considerable extent. The following estimate was given at Behar, where the greatest number of the manufacturers is settled :—

Take 42 sers tallow, 5 rs.; 15 sers linseed oil, 1 r. 10 anas; 2 sers lime, 2 anas; 8 sers impure soda, 6 anas; firewood, 4 anas:—Sers, 67; 7 rs. 6 anas;—Produce 84 sers of soap like the lumps mentioned in my account of Bhagalpur, 11 rs. Average profit, 3 rs. 10 anas.

Each boiler makes this quantity twice a month; but two families, on an average, join about each boiler, as they also burn and sell lime. At this rate the 77 families in this district would make annually 77,616 sers (159,300 lbs.), worth 10,274 rs. This quantity, however, seems to be greatly underrated; and it is probable that, except a few families who make lime as in Behar, each has a boiler; for Patna soap is used all over Bengal. At Gaya, indeed, I received a very different estimate, and one which appears more rational. It was said that each man could make 40 sers (72 s. w. each), or almost $77\frac{1}{2}$ lbs. in from three to four days. Allowing for sickness and other avocations, we may calculate that he may make this quantity seven times a month. The materials and fuel for 40 sers cost 4 rs. 8 anas, 6 pices, and the value of the article is 5 rs. 8 anas; so that he makes a profit of 6 rs. 12 anas, 6 pice a month, and his soap will annually be 6,500 lbs. But allowing only one man for each of the 77 houses in the district, the

quantity made will be more than three times that stated in Behar, that is to say, about 500,000 lbs., worth about 35,000 rs. Wax candles are made by seven houses. The material comes chiefly from Nepal, but some is brought from Ramgar. The candles are of different qualities, according to their whiteness and purity worth from 45 to 55 rs. a man (76 s. w.), or $76\frac{1}{2}$ lbs. They are very inferior in appearance to the candles made in Europe.

The torch-makers (bari) are a numerous class. They make their torches, as usual, of cotton rags, that they chiefly procure from the dead bodies of Hindus, which, before they are placed on the pile, are stripped naked, and the cloth is thrown into the river, from whence it is collected by the Dom, and sold to the torch-makers. But these Baris, although they work in this impure material, gain their chief living by making a kind of platters of leaves, which, although stitched together by their dirty hands, and although incapable of being washed, are considered as perfectly clean by the Hindus, who would shudder at the idea of eating from a vessel of china ware, queen's ware, or glass, least it had been used by an impure person. The leaves chiefly used here are those of the *Buteafrondosa* (Roxb.) (paras), from 6 to 12 of which are required for each platter. A man and his wife may make 3 rs. a month.

The gay and dressy youths of Patna employ certain men, named Pagriband, or Dustarbund, to wrap their turbans in a fashionable manner. The turban preserves its shape so long as it is clean; but it is often unfolded either to be washed or fresh dyed. These people make from 3 to 5 rs. a month.

Tailors, owing to the prevalence of the Muhammedan and west country dresses, are numerous and well employed; and a man can make from 3 to 6 rs. a month, besides what his women gain by sowing or spinning. Several of them are Hindus. The tent-makers work in the same manner as those in Puraniya.

The barbers here are on the same footing with those in the western parts of Bhagalpur; but none of them have studied anything like science. Some

of them, chiefly Moslems, are a kind of barber-surgeons, very rash and ignorant. They extract blood by a kind of cupping, there being here none of the Hela caste, who in Bhagalpur perform that operation. Leeches are applied by the women of the sweepers.

The Nat follow the same professions as in Bhagalpur, but many vagrants intrude on their profits. The five families who have a fixed residence would indeed be quite inadequate to carry on the business.

The Abirgars live in part by making the red starch, which is thrown about at the festival called Holi. The starch prepared at Daudnagar is made from coarse grain, and is very inferior to that prepared from the root of the scitamineous plant called Tikhur. It is only made during the three months that precede the festivities, as the loss of capital for nine months would be considered a more serious evil than the loss occasioned by that want of skill which must always arise from a temporary employment. The men mentioned as Abirgars are in fact petty traders, who know the process and hire labourers whom they direct. The following they give as their process; take 1 man (45 s.w.=1 ser, $49\frac{1}{2}$ sers=man) or 45 $69/100$ lbs. of the Gehungya Janera (*Holcus Sorghum*), worth by retail 8 anas, and of Lodh bark 10 sers. (9 lb.) worth 4 anas. Grind them to a powder in a hand mill. Take $6\frac{3}{8}$ sers (6 lbs.) of sappan wood worth 3 anas, and $1\frac{1}{2}$ ser ($1\frac{1}{2}$ lb.) of impure soda worth 1 ana. Divide these into four portions, and boil each in 10 sers (9 lbs.) of water. The flour is first thrown into one pot of the decoction, and after standing a little the paste is made into balls, which are dried in the sun, then broken, and thrown into the second pot of the decoction, and dried again. This is repeated with the third and fourth pots, when the operation is completed, and produces one man of the Abir or red starch, which is worth $2\frac{1}{2}$ rs. The above materials cost $1\frac{5}{16}$ rs., fuel costs 2 anas, and 4 labourers cost 8 anas: the total cost therefore is $1\frac{1}{2}\frac{5}{8}$ rs., the profit 9 anas.

The red lead made here is not of the best

quality, but supplies a great part of the demand of the country, which is great, both for female ornament and as offerings to the gods. Some is exported, but some is imported, some from other districts, and a little of a superior quality from Europe.

I had no opportunity of learning the process followed by the maker of vermilion (Singriph) which is used as a paint in finer works, and rich women occasionally add some to the red lead with which they paint their foreheads.

Those who prepare ornaments of lac are numerous, and are all Hindus. Each family may gain from 4 to 6 rupees a month.

A man at Gaya who, besides himself, has in his family four persons, said that he daily required 1 ser (2 lb.) of lac worth $2\frac{1}{2}$ anas, with red lead and other colours, and fuel to the value of $2\frac{1}{4}$ anas. These made four pair of rings, worth 9 anas, so that he had $4\frac{1}{4}$ anas profit. His wife sells the rings, but he cannot work every day; otherwise he would have 8 rupees a month. He indeed said that his daily family expense was 4 anas, but in general it was there asserted that a man and a woman could in a month work up 7 R. worth of materials into 11 R. worth of rings, giving only half as much for their total expenditure. In Behar it was said that a man in a month required only 1 Rupee worth of materials and made 4 Rupees worth of ornaments. No lac is used here for making these ornaments until the colour has been extracted.

Those who make ornaments of the kind of glass called Kangch are numerous, and are all Muhammedans. They work like those of Munger, and their processes require no farther explanation, but 14 of the houses in Patna employ themselves entirely in making the frit, which is formed into ornaments by the others, and is a very useful division of labour. Many of those again in the country waste their time, not only in going through the whole processes of the art, but in collecting the soda that they use. They collect the saline efflorescence from Aghan to Magh (from the middle of November to the middle of February), and as they

collect it, throw it into a cistern or reservoir lined with smooth kneaded clay. This cistern usually holds 20 mans (1600 lbs.) of the saline earth, and to collect this quantity requires from 10 to 20 days of a family's labour. The cistern is then filled with water, and this is allowed to evaporate by the action of the air, which requires from 10 to 12 days. When dry, the bottom of the cistern is found covered with a thick saline crust, a considerable part of the earth, with which the soda was originally mixed, having subsided, before this saline substance began to separate from the water. This soda makes glass without addition, as it contains a great portion of earthy matter. The people who prepare it use the whole in their own furnaces, so that it is not sold, nor can its price therefore be ascertained. The people of this profession seem to be poor. The men allege that they cannot make more than 2 rupees a month.

The Tikisaz make small ornaments of mirror, which the native women paste on their foreheads between the eyes. The glass is thin, and of various shapes and sizes. The tinfoil is only pasted to the glass, and is painted with various bright colours to make a show. From 200 to 2,000 of them sell for a rupee. The ornament is fixed on the skin by means of a little bee's wax. The Minamorussas make false stones for rings in which art they are very rude, as they take merely two plates of glass, between which they confine some bright colouring substance.

They also give various colours to gold and silver, that are highly ornamental in the handles of swords, and other such work. They paint on glass and make mirrors. The Shishahgurs blow glass. The material consists entirely of European glass-ware; but, although they only use the fragments of the finer kinds, their work is rude, owing to the imperfection of their furnace, the glass is usually filled with air bubbles, waves, in nobs, and every other imperfection: it even in general loses part of its pellucidity, and acquires a greenish colour. They however allege, that with pains they could make glass as clear as the European, and could

form anything for which there was a demand; but they have no encouragement, as the natives require only bottles for holding rose water, and phials for containing essences; and will go to no price, that can be possibly avoided. In each furnace they usually put five sers of powdered glass (that of wine bottle is considered useless), and to melt this requires 200 sers of fuel.

A few people live by making ink, which is kept both in a liquid and solid form. 95 s. w. of linseed oil give 4 s.w. of lamp black collected by an earthen lamp. Take 4 s. w. of lamp black, 5 s. w. of gum of the *Mimosa Indica*, add a little water, and rub in an iron mortar with a wooden pestle for 3 hours, then infuse $1\frac{1}{2}$ s. w. of gall nuts in 10 s. w. of water, and add the strained infusion to the rubbed materials. Then rub again for 3 hours, then put the pot into the sun, until the paste dries sufficiently to admit of its being made into small lumps, which are dried in the sun. These do not spoil by keeping a considerable time.

Those who make a separate profession of thatching houses, also cover roofs with tiles. In fact, in most tolerable houses the roof is first thatched with straw, and the tiles are laid on above the thatch. The heat otherwise would be excessive; but the practice no doubt greatly increases the danger from fire.

The Domra and Bangsphor work in bamboos exactly in the same manner as described in Bhagalpur, but the former are exceedingly vile, removing dead bodies and acting as public executioners. At Gaya it was intimated that each adult male or female can make bamboo work to the value of 6 paysas a day, of which the bamboos will cost 2 paysas. Allowing that they work 26 days a month, a family of five, including two workers, will make 46 Rupees a year.

The Petara is a kind of ratan basket with a lid, which serves as a trunk. They are here usually covered with cloth painted green and are considered as of a very good quality, the military at Dinapur having found them very convenient packages and having improved the fabric.

The Morhasaz make a kind of ratan stools. Some have the seat wrought with split ratans, others have cotton thread, and the coarsest have ropes of the grass called sabe. The best are covered with painted leather but are not very ornamental. The leather is put on by the shoemaker and is painted by the Nakkash. The Morhasaz makes only the frame.

A considerable quantity of paper is made at Behar and Arwal. It is whiter than that made in Ronggopur; but has all its other imperfections, and that of Behar especially is less durable, while the least dampness in the air occasions common ink to sink, so as to form almost illegible blots. It is only ink made of the cakes prepared as above-mentioned, that can be used with such paper. At Behar the paper most commonly made is that called Dufturi, which is 19 by 17½ inches a sheet, and is that used in common business; but other kinds of a large size, and rather superior quality are made, when commissioned. The material is old bags of the *Crotolaria juncea*. These are cut into small pieces, and, having been soaked in water, are beaten with the instrument called a Dhengki. The pulp is then put on a cloth strainer, washed with water, and dried on a rock. This substance is then put into a cistern with some ley of soda, and is trodden with the feet for some hours, after which it is in the same manner washed and dried, and these operations with the soda are in all performed six times. The bleached pulp is then put into a cistern with a large quantity of water, and is diligently stirred with a stick for about three-quarters of an hour, when it is wrought off into sheets as usual. The moist sheets are stuck on a smooth wall, and dried. Having been rubbed with a paste made of flour and water, they are then smoothed by placing them on a plank, and rubbing them with a stone. The expense and profits of making seven reams are as follows:

Forty-two sers (86½ lb.) of old bags, 2rs.; 42 sers impure soda, 2rs.; 42 sers lime for making the ley, 1r.; labourers for beating with the Dhengki, 1r. 12 anas; a man to stir about the materials,

8 anas; pasting and smoothing the paper with a stone, 5 anas; flour and fire-wood for making the paste, 2 anas 6 pice; drying the sheets, 4 anas; cutting the paper, 6 pice.—Total, 7 rupees.

The guddi or ream consists of 10 quires (destahs) each containing 24 sheets, and sells by wholesale at $8\frac{3}{4}$ rs. so that the maker has $1\frac{3}{4}$ rs. profit. He does nothing but form the sheets, taking them as usual from the cistern on a frame, which retains the paper, and allows the water to escape. He makes about one ream a day; and, if he works 315 days in the year, he will earn about 80 rs. a year; and in fact, these people are in easy circumstances. In the 30 houses at Behar are 100 men, and in the 13 divisions exclusive of Arwal, that are in the district, there are probably 40 houses, or in all 140 men, who, at the rate above-mentioned will make paper to the value of 32,000 rs. a year.

At Arwal 20 families keep an equal number of beaters (dhengkis), and the estimate, which I procured, depends on the work performed by each of these. On the opposite side of the Son river however, in Shahabad, are 50 beaters, and the whole produce of these is sold as Arwal paper, which although made of the same materials is whiter and more durable than that made at Behar, and is commonly used by Persian writers all over Bengal. Each beater usually makes five bales in the year; and each bale contain 20 reams.

Two bales of the first quality at 4rs. a ream, 160rs.; 2 bales of the second quality at $3\frac{1}{2}$ rs. a ream, 140rs.; 1 bale of the third quality at $2\frac{1}{2}$ rs. a ream, 50rs.—Total, 350 rupees.

The total paper therefore made by 20 beaters will be worth 7,000 rs. The following is the statement, that I procured, of the annual expense attending each beater:

To 2,620 sers (46 s.w.) or about 3,069 lb. of old bags or nets, which are still better, 57rs. 8 anas; to soda 2,340 sers, or 2,762 lb., 45rs.; to lime, the same quantity, 30rs.; to flour for paste, 5rs., to cloth for strainers, baskets, &c. 2rs.; to moulds, or frames, 1r. 3 anas; to labourers for beating, &c. 80rs.; to working off the sheets, 25rs.; to drying and

smoothing, 7rs. 15 anas 6 pice; to pasting, 5rs.; to cutting and packing, 15rs.—Total, 286rs. 6 anas 6 pice.

The neat profit therefore on each beater, besides paying every person for his labour is 73 rs. 9 anas 6 pice. The materials are divided into five equal shares, each capable of making one bale. Under the beater of the implement is a small cistern, the bottom of which is stone. In this is at once put the fifth part of the old bags or nets with a large quantity of water, and it is beaten for six days, after which it is washed on a strainer. It is then beaten two days with a ley of soda, washed and dried. This beating with the ley of soda is done in all nine times, after each of which the pulp is washed and dried. In dry cold weather each subsequent beating occupies eight or ten days, in the hot season five or six days are sufficient. The paste, when thoroughly bleached, is formed into sheets as usual. All the sheets formed in one day are in the evening placed under a plank, on which two or three men sit for about an hour to squeeze out the water. It is then stuck on a wall, and falls off next morning when dry. It is then pasted on one side and dried, and then it is pasted on the other side and dried, rubbed with a stone, and cut square. All the paper-makers here also are Muhammedans. The Mohurahdars are persons, who smooth paper by rubbing it with polished glass, which obliterates entirely the marks of the frame, as is done by hot pressing, and gives the surface a glossy smoothness. This operation costs from eight to ten anas a ream, and the workmen must make very handsome wages.

Although many great idle fellows amuse themselves with paper kites, the makers cannot live the whole year by this profession as few amuse themselves with this sport except in the cool season. The makers therefore retail toys for children, which are made by the potters, and the apparatus used in smoking tobacco. Their kites (telanggi or guddi) are not superior to those of Puraniya. Those who make fireworks are not superior to the Atushbaz usual in Bengal. The

fireworks are chiefly employed at marriages. At other seasons the same people make gunpowder, of which a good deal is used. The natives seem to delight in the noise of fire-arms, and fire powder merely for pastime; but many people in these districts are constantly provided with arms and ammunition; as a defence against robbers, or rather from family habits, considering themselves as born soldiers. They do not however parade in arms, and few of them now appear in public with even swords.

Of four descriptions of tanners, two prepare the leather, while the two other kinds work up the material. The Kimokhtsaz prepare leather from the skins of horses and asses, and dispose of it to the shoe makers. It is only the skin of the hinder parts that is used. This is put four days in water, and then the hair is removed by scraping. Then the flesh side of the skin is covered with the small millet called China, which is pressed into the skin, and forms numerous pits on its surface. It is then dried in the sun, and scraped, after which the hair-side is scraped five times. The skin is then dipt in water, after which the flesh-side is again scraped, and the leather is boiled in a solution of the salt called Bherkhari. The flesh-side is then covered with copper filings and sal ammoniac, and then with a layer of grass. Above this are laid eight or ten hides one above the other, and treated in the same manner. The whole is pressed by a weight. In eight days the skins are found of a fine green colour, and are fit for use. Each piece of skin, which makes the upper leathers of a pair of shoes, sells for five anas.

The Dabgars make leather bags for holding Ghiu (butter) oil, and thin extract of sugar cane; they also make targets of the hides of buffaloes, and glue. The bags are of two sizes, the larger made of the hides of buffaloes, the smaller of those of oxen; both of which are purchased from the butcher. Two buffaloes hides or six ox hides cost a rupee. The skins, without any preparation are soaked four days in water, and are then scraped with an iron instrument to remove the hair and impurities.

While still moist they are cut into pieces so as to apply on a mould like a pot, made of unbaked clay, and of the shape and size of the intended bag. Each bag consists of two or three pieces, which are not sown together, but cohere, where they overlap. They are allowed to dry four days on the mould, which is then broken, and taken out. Three buffaloes' skins make four bags worth two rupees. The materials cost $1\frac{1}{2}$ r. The targets are two spans in diameter, and are made on a mould in the same manner as the bags. They consist of four folds of skin, and 15 targets require three hides worth $1\frac{1}{2}$ r. When taken from the mould the targets are varnished by applying 20 times, in the course of 45 days, a composition of two sers of Dhuna or the resin of the *Shorea robusta*, of one-half ser Kharwa, a fine resin which I believe is that of the *Vateria Indica*, and of three sers of linseed oil. Every time that the target has been covered with this varnish, it is dried, and rubbed with charcoal prepared from the reed called Kutra. The varnish costs six anas, and in the state above-mentioned the 15 targets, the materials for which amount to $1\frac{1}{8}$ r. are sold to traders for $7\frac{1}{2}$ rs. These dealers employ other workmen to paint the targets, or to apply brass or iron bosses, and then sell them for about one rupee each.

The Chamars of these districts are like those of Bhagalpur, and in the country parts are chiefly employed to make coarse shoes, leather ropes and drum heads, which they also beat with great diligence.

At Patna and Danapur there are very good workmen, who make shoes after the European manner; and in all towns they make neat shoes and saddles for the use of natives, and they cover stools and baskets. The demand is considerable for shoes, the soles of which are of leather, but the upper part is of European woollen cloth embroidered with silk. Formerly the cloth was usually black with embroidery of bright colours, but of late white and yellow cloths have become fashionable. They sell at from 10 to 16 anas a pair. Shoes called Zuri, the upper part of which are of fine

broad cloth or velvet, embroidered and bespangled with gold and silver, sell at from 1 to 16 rs. a pair. The demand is very considerable, and large quantities are sent to Bengal. The makers are easy in their circumstances, and work chiefly by day wages for some traders, who supply all the materials. They get two or three anas a day for wages, and, except the Chamars lately employed, are all Muhammedans.

In every part of India, where the people were shod, they rather used slippers than shoes. They had no ears for tying or buckling them on the foot, and the heel was never worn up, although, for what reason I do not know, they were generally provided with heels. The common coarse shoes, however, used by those who labour or walk, are now very often worn with the heel up. This custom seems to have been first introduced among the native soldiers in the British service, and has been found so convenient, that labourers have usually adopted it. Men of rank and their attendants, however, continue to wear their shoes like slippers, for the purpose of throwing them off whenever they enter a room, which they still continue to do every where, except in the houses of Europeans, in which all natives of rank now imitate our example. Long points, like those used in Europe in the fifteenth century, have for some years been highly fashionable, and, I am told, were introduced from Lucknow, about 20 years ago.

Saddles are highly ornamented after the native fashion. The Khugirdoz make saddle-cloths, not quite so long as those used by the European knights of the fifteenth century, but still very unwieldy, and loaded to an extraordinary degree with tassels, fringes, straps, and all manner of appendages.

The whips made at Patna are for horsemen, and consist of plaited leather thongs tied to a short wooden handle.

These, who prepare the tubes used for smoking tobacco, are reckoned better workmen than those in Bengal, but not equal to those of Lakhnau.

Very few of the tubes made here are ornamented with gold and silver.

The implement used for smoking tobacco, which is made of the cocoanut, is much used, but is chiefly imported, ready made.

The Diyawals at Gaya make cotton wicks for lamps, and the incense (Dhup) offered to the Gods, which is a composition made of various substances powdered and then formed into little cylinders from 3 to 5 inches long, and as thick as a goose quill. The best kind, called Sorashangga, I am told, consists of the following articles: Guggul, a dark coloured gum-resin, the usual incense of the Hindus, said by the natives to be the produce of a small tree, which Dr. Roxburgh calls the *Amyris subtriphylla*; Dhuna, the resin of the *Shorea robusta*, which is the only other kind of natural incense offered by the Hindus; Saral, wood of the *Pinus longifolia*; Devdaru—At Mungger I was shown for this a bit of European deal, but at Patna I am shown a white sweet-smelled wood, said to come from Nepal and which has not the odour of a pine; Chandan, sandal wood of Malabar; Agra, *Agallochium Secundarium*, E.M.; Tejpat, the leaves of a *Laurus* mentioned in my account of Ranggopur; Gandhabala, the herb of a species of *Plectranthus*, which is the Katu Kurka of Hortus Malabaricus; Kur, a porous strong-smelled root, as thick as the thumb; Jatamangsi, the root of a Valerian, supposed by Sir W. Joones to be the spikenard of the ancients; Mutha, the root of a *Cyperus* with a sweet swell; Haritaki, the fruit of a *Terminalia* mentioned in my account of the forests; Lakhi seems to be the operculum of a univalve shell; Laha, seed lac; Gur, the extract of sugar-cane; Sailaj, a drug which I have not seen.

Most of the tobacco is here prepared for smoking by those (Modis) who retail provisions; but some is prepared as in Bhagalpur by the confectioners(Halwai) and by those who sell paper kites, and a good deal by those who make the business their sole profession.

Some of those who prepare tobacco, prepare also the charcoal balls used in smoking, but some

persons, chiefly old women, procure a living by making these balls; and they are often made by those who keep inns.

I have not here been able to procure a full account of the ingredients that enter into all the intoxicating sweetmeats. The most usual are called Majun, from whence the preparers derive their name; but there are various other kinds, and the demand in Patna seems to be pretty considerable. Sugar, hemp leaves, and ghiu, are the chief ingredients in the Majun, which is made as follows:—Take five rupees weight of dried hemp leaves, and rub them well with an equal quantity of ghiu, or prepared butter. Boil these in 160 rs. weight of water, till one-half is evaporated. Strain this through a cloth, and squeeze the herb thoroughly. When cold, scum off the butter, which is impregnated with the qualities of the hemp, and add it to a syrup prepared from 80 s. w. of sugar. When cool, this syrup is made into tablets. These are eaten by the rich, in hot weather, to give them an appetite, and in cold weather to keep them warm. If too much is taken, the Majun produces intoxication.

The distillery of spirituous liquors is carried to a very great extent, entirely however for consumption on the spot. Each of the 483 shops has only one still, which does not differ from those of the districts hitherto surveyed, being always made of unglazed earthen ware. The materials used are the Mahuva flowers (Bassia) and thin extract of sugar-cane, generally mixed, but sometimes separate, according as one or other is cheapest. The different qualities of the liquors never enter into consideration, the only point being how to get as drunk as requisite at the smallest possible expense.

Some of the stills pay as high as 10 R. a day, and are larger than those which pay small duties, but much pains has not been paid, I believe, to the regulation of this point; and the difference of daily duties, which vary from 12 anas to 10 rupees, seems to be chiefly ascertained by one person's bidding against another for the monopoly of a certain

extent of market. This, and the desire of getting drunk cheap, render the liquor quite abominable.

In Bhagalpur I have dwelt sufficiently on the process, which is quite the same, whether the flowers or the extract are used. The larger stills, requiring a considerable capital, belong usually to a number of partners, who seldom do any other work than to retail the liquor; the profits therefore must be very considerable. The calculation of the monthly expense and profit of a still at Gaya, daily paying 7 rs. to Government as duty, and distilling, 15 or 16 times, 30 sers (72 s. w.), or $55\frac{1}{2}$ lbs. of Mahuya flowers, is as follows:—

To flowers, 232 rs. 8 anas; to firewood, 11 rs. 4 anas; to pots, 9 rs. 6 anas; to duty, 210 rs.; to three servants 6 rs.; total, 469 rs. 2 anas. By $15\frac{1}{2}$ mans (each $77\frac{1}{2}$ lbs.) of liquor daily, at 18 anas a man, 523 rs. 2 anas; profit, 52 rs.

Four persons are concerned, each making 13 rs. a month. In this country 13 rs. a month is a very comfortable subsistence for a large family; but still, considering the responsibility to Government of 7 rs. a day, and the capital of 70 or 80 rs. required, the profits seem too small, and have probably been somewhat underrated, as might be naturally expected.

The Pasis who collect palm wine (Tari) and the shops which retail it are on the same footing as those of Bhagalpur. In the tables 2846 Pasis have only been entered, because in several divisions I procured only a list of the shops without any estimate of the number of men that they employ. If the proportion in the 131 shops of which I received no estimate be the same as in the 120 shops which are said to employ 2846 men, the total number employed will be 5953.

Those who distil perfumes complain that the business is overstocked and that the prices have of late been much reduced; but they still seem high, and no dependence can be placed on what they say, no two of them agreeing in their accounts; but they are in easy circumstances. They use a copper still which may hold from 150 to 200 lbs. of water, and has a flat head. A tube,

bent at right angles, conveys the vapours into a copper cucurbit, which serves as a recipient, and is placed in a widemouthed earthen vessel to contain water for condensing the vapour. The whole apparatus, and the place where it stands, are exceedingly slovenly. The artists make three kinds of water, from roses, from the *Pandanus* (Keara), and from the lime (*Citrus*); but the quantity of the two latter is very trifling. The rose water is either single or double-distilled, the latter being drawn a second time from fresh roses. These flowers are only used when fresh gathered. Even in three hours they are supposed to lose their perfume. The single-distilled rose water sells, by wholesale, at from 12 to 13 rs., and, by retail, at from 16 to 20 rs. the man, which weighs about 76 lbs. Each distillation, according to some, for a man of water requires 22,000 roses, and about 56 sers of water, of which 40 only are drawn off. The double-distilled rose water retails at 2 rs. a ser ($1\frac{9}{10}$ lb.), and being only in demand among Europeans, is not made, except when commissioned. Others allege that all is distilled twice, as such alone will keep, and that what is required for common use is diluted with water, when wanted. The other waters are distilled in the same manner. All their essences consist of sandal-wood oil, impregnated with various smells, for imbibing which this oil has a strong capacity. The best workmen distil their own sandal oil, but some is imported. The sandal wood comes from Malabar. It is rasped, soaked three days in a little water, and put in the still with water, and the oil is found floating on the surface of the water in the recipient. It is distilled to dryness. Sandal oil alone is not used as a perfume, but is impregnated with many odours by placing it in the recipient, and distilling over into this the waters from various substances, such as roses, the flowers of the Bel (*Jasminum sambac W.*), spices, the roots of the Andropogon called Kus, the flower of the Chameli (*Jasminum grandiflorum*), that of the Mulsari (*Mimusops Elenqi*), Agar wood (*Agallochum*), the flower of the Keara (*Pandanus*), the flower called

Juhi (*Jasminum*), and even clay. The most common by far is the rose, and what is in almost universal use among the natives of India, as atur of roses, is sandal-wood oil impregnated in this manner, which, according to its quality, sells at from 1 to 2 rs. for a rupee weight, while the real essential oil of roses costs 50 rs. at Patna. The sandal oil seems to extract the whole perfume from the rose water, as this passes into the recipient.

The next most common essence, called Motiya, is made from the Bel flower (*Jasminum Sambac*), and is cheaper than the common essence of roses. The only other essence commonly used is that impregnated with the odour of spices and called Mujmua. The ingredients vary from 5 to 50, but cloves, nutmegs, mace, greater and lesser cardamoms, and saffron are the most common. It sells for from 1 to 3 rupees for a rupee weight (3 drams apothecaries' weight) but is not at all agreeable to my sense of smelling, which is indeed the case with all the others. By the skill however of European artists they might perhaps be rendered useful ingredients in perfumes, as they preserve the smell of various very agreeable odorous substances, which could not be readily procured in Europe, especially that of the Pandanus flower. The most strange of these essences is that made with the clay, which communicates to oil of sandal-wood the smell, which dry clay emits, when first wetted, and which to me is far from agreeable. It sells at $1\frac{1}{2}$ rupee for each rupee weight. The best sandal oil costs here about half a rupee for the rupee weight.

The workmen of Bar, instead of a distilled oil, impregnate an expressed oil with the odour of the Chambeli flower (*Jasminum grandiflorum W.*). At the beginning of the flowering season they take 82 sers (about 169 lbs.) of the seed of Sesamum (Til), and every fair day during the season add to one-half of it as many flowers as they can collect, which may be from one-fortieth to one-fourth of its weight; next day these old flowers are picked out, and put to the other half of the seed. The season lasts about three months, and the whole quantity

of flowers may in that time equal the whole weight of seed; but one-half of the seed is impregnated entirely with the fresh flowers, while those given to the other half are withered, and have lost part of their strength. The seed is then squeezed in a common oil mill, and each gives 12 sers, or about 24 lbs. of oil; that impregnated by the fresh flowers being of twice as much value as what is impregnated with the withered. I am told that the 12 sers of the best kind are mixed with 96 sers of common oil of sesamum, and the mixture here sells at half a rupee for the ser, so that it brings 54 rs. The people who make it valued it at 12 rs., and thus made it appear that they lost by the manufacture; but they live easily, and do no other work than to pick the flowers from among the seed, and mix and retail the oil. The inferior oil at the same rate will bring 27 rs., and the total value will be 81 rs. The real charges are 82 sers of sesamum seed, at 25 sers a rupee = 3 r. 5 a. 9 p.; 44 sers of oil of sesamum, 15 r. 12 a.; 2 mans of flowers, 12r.; expressing the oil, 8 a.; total, 19 r. 9 a. 9 p.; profit, 61 r. 6 a. 3 p. Those who express oil from various seeds (Teli) use the same mill exactly that is used in the districts hitherto surveyed; but on the whole they are rather richer than those of the greater part of Ronggopur, Puraniya, and Bhagalpur, although they are not so wealthy as those near the Nagor river, in Dinajpur and Puraniya. At least three-fourths of the whole have stock enough to enable them to purchase the seed and to sell the oil; and, not above one-fourth express the oil for hire. Farther, one-half of the whole are not only able to purchase the seed which they squeeze, but have also some good carriage oxen, with which they trade in other grain; the oil-cake giving them a facility in feeding the cattle. All the mills are turned by cattle, and some few have two, that work by turns. About towns some have more than one mill. The rate of hire does not differ materially from that in the districts hitherto surveyed. The profit admitted at Gaya by those who purchase the seed and sell the oil is as follows. Each mill grinds three times a day,

and at each time receives 3 sers, or (72 s. w.) $5\frac{1}{2}$ lbs. mustard seed. At each time the owner gets $\frac{1}{4}$ parts of the weight of the seed in oil, and $\frac{1}{4}$ ana worth of cake.

Produce of oil, 6 anas; produce of cake, $\frac{3}{4}$ ana; total, $6\frac{3}{4}$ anas. Expense of seed, $4\frac{1}{2}$ anas. Profit, $2\frac{1}{4}$ anas.

None of the Dahiyars, or those who make curds and boiled butter, are rich like those of Mungger, and more of them than of any other profession are accused of being thieves and robbers: yet they seem to be industrious, receive high wages and are very mean in their dress. It is said that they live very plentifully. The young men in general are mere farmers, while the old people and children tend the cattle, and the women prepare and sell the milk and the cakes of dung that are used for fuel. The same preparations of milk that are used in Bhagalpur are here in request.

From two manners of extracting the butter and curdling the milk the Dahiyars are here divided into two classes, Guriyas and Majrotis, the one never operating after the manner of the other. The Guriyas make the butter first, by churning the milk as it comes from the cow; for in this country, except by exposing it in porous pans to the air during the coldest weather, the cream does not separate from milk, and this separation is not attempted by the natives, who do not know what cream is. The milk that thus remains, after the separation of the butter, is curdled by the Guriyas, and is called Mahuya-dahi. The Majrotis on the contrary begin by curdling the milk, and thus make Mitha-Dahi, and it is by churning this substance that they procure butter. Almost the whole buffalo milk in these districts is managed by the former process.

The butter makers of Patna and Bakipur are employed by Europeans.

The Mayras, who make sweetmeats after the fashion of Bengal, reside at Patna on account of the Bengalese that frequent this city.

The Halwais make sweetmeats after the Hindustani fashion, full in general of rancid oil,

but in large towns well-soaked in ghiu for the use of the wealthy. In the two capitals are some who are rich, and whose work is held by the natives in high estimation, especially the Barphi of Kalyan in Patna, which is prepared of curds, (Kohir) sugar and rosewater. It has not a bad taste, but is not sightly. Some of the Halwais prepare sugar-candy, but I have not seen the process.

The Halwais here make the same things that in Bengal are prepared by the Puya Phulauris.

The persons called Khanchahwalehs make several kinds of sweetmeats and parch some kinds of pulse. I have not learned their operations, but they are poor and retail their commodities in the streets.

Those who parch pulse and maize are called Bharbhuna or Chabena furosh and are much employed. They are all women, many of them however young, and generally sit in the streets with a little fireplace, parching for all the people in the neighbourhood, and receiving a little of the grain from each. They may get in Patna 2 paysas a day, but in other places they make less. A few are able to purchase grain, parch it in their house and retail it in a shop. These make a good deal more.

Besides the Bharbhunas or Chabena furosh, there are two descriptions of persons who live by parching grain. The Khasiyawalehs boil pease, season them with turmeric and capsicum, and then parch them. The Kungjtilayis parch seed of sesamum, janera, and rice, which they mix with extract of sugar-cane, and form into balls. Both retail their commodities in the streets.

Those who make a separate profession of grinding flour are confined to Patna, Sahebgunj and Danapur. In the country each family grinds its own; and for strangers the retailers of provisions (Khichri-furosh) hire people to grind; but the finer kind of flour called Suji is only procurable in the above three towns, and in Bar and Behar. In other places it is the coarse flour called Ata that is alone procurable. The Ata is flour ground after the European manner, that is, the whole grain is reduced to a meal of equal fineness, but the bran

is separated; 40 sers of wheat give 34 or 35 sers of Ata. At Patna for this operation is paid from $2\frac{1}{2}$ to 3 anas for 40 sers (76 lb.) of wheat, which sells now at 16 anas, which will serve to show the enormous saving that arises in England from the use of machinery. Here it is ground in hand mills at which both men and women are employed. The labour is very hard so that the people seldom work more than three hours in the cool of the morning, and two women at the same mill do not in a morning grind more than 20 sers of wheat (38 lb.).

Those who make a separate profession of splitting pease are confined to Patna, but the operation is every where performed both in the families of the tenantry and by those who retail provisions.

The Nanwais or bakers are similar to those in Bhagalpur and Puraniya. The bread, which the bakers make after the European fashion, is most excellent.

Faludah is a kind of wheaten cake, and those who make such as an exclusive profession are called Faludahwalehs.

Those who kill goats and sheep are called Bukurkussabs. To distinguish it from mutton, the tail of the goat is always preserved adhering to the carcase, the flesh of the goat being reckoned by the natives much superior to that of the sheep. No good mutton is sold in Patna.

The Kussabs kill the sacred animal, and at Dunapur, in the hot season, some natives sell tolerable veal, killing once or twice a week. In the cold season they kill beef. An European at the same place sells all sorts of animal food of an excellent quality; but it is only during the cold season, when he can salt what is not disposed of, that he can afford to give beef, or any considerable variety.

The Bawarchis, or cooks, who adhere to the Hindustani fashion, dress as usual by the hundred weight, and are all Molems of pure hands; but many of the cooks belonging to Bakipur are people of the very lowest dregs of abomination, who have taken upon themselves to cook for Europeans.

Section II. Of those who work in more durable materials.

The Khandiyars of Patna work in buffalo horn and ivory. Of the former they make hair combs, cups, handles of knives, and some other trifling articles; with the ivory they inlay boxes. They can both turn and carve. The Kangghai make wooden hair combs. The turners (kharadi) of Patna work in wood, and make chiefly cups for drinking and keeping oil, small boxes, and play-things for children, some of which are exported. These wares are painted.

Those in the other parts make the same articles that have been mentioned in my account of Bhagalpur; but they are unable to supply the demand, which is done by those who are both carpenters and turners.

The Khadambands make the frames of looking glasses and pictures of coarse wood, and some are sent to Calcutta to be filled and ornamented, while a few are required here for the Minamorussas. Their work is very coarse.

Those who paint houses, boats, palanquins and some furniture are called Rungsaz or Kumangur. The latter were originally bow makers and still are occasionally employed to make that implement of war. They use a great deal of tinsel and false gilding, but, were they employed to work for Europeans, are capable of finishing as neatly as those of Mungger.

Sawyers work in the same manner as in the districts hitherto surveyed, and are sometimes paid by the day, getting from 2 to 3 anas each; but in general they work by the piece.

Some people in large towns make a separate profession of splitting firewood and are called Beldars, but this is a term applied to various other persons, especially to pioneers.

The Barhai here in general work only in wood, and the greater part make coarse furniture and the implements of agriculture: but many of them are also turners, and near the Ganges some of them

build boats. None confine themselves entirely to this branch of the art, but a great many are entirely ignorant of its mysteries. The number of boats built seems to be very trifling, nor could I procure any estimate on the subject. About 100 houses at Patna and Danapur are good workmen, and make tables, chairs, bedsteads, sofas and carriages after the European fashion, and fully as well as at Mungger. An European carpenter at Patna formerly made up carriages and furniture, some of which he sent to Calcutta, and much of the proficiency of the workmen is probably owing to his exertion. Since he has given up business the workmen are chiefly employed by Europeans in the adjacent districts, and by those passing up and down the rivers, as the furniture is very cheap, and by some of the rich natives to make carriages. The wood which they use is chiefly Sisau and Sal and comes from the forests of Gorakpur.

In Gaya I understood from a workman that his family consisted of five persons and that his usual daily expenses were 2 anas for food, fuel and tobacco. His wife, besides managing her family, bringing water and cooking, spun as much thread as clothed the family, but the man paid for the cotton and weaving. He paid also house rent, and for ornaments and ceremonies, so that we must allow that every working day he earned about 4 anas. In the country they pay no house rent and receive most of their allowances in grain which, valued at harvest price, produces a low nominal reward, but keeps them in plenty of food.

There are, in the country parts especially, a good many who unite the professions of carpenter and blacksmith, but who make chiefly the implements of agriculture. The carpenter and blacksmith who make these, whether the same person performs the same offices, or two men are employed, usually belong to the manorial establishment, and the payment for the implements of agriculture arises from a share of the crop.

The Lohars, who work in iron alone, everywhere make the implements of agriculture,

and coarse cutlery; nor in these districts are there any such fine workmen as those of Mungger. At Patna they make vessels for boiling sugar and sweetmeats, the drums called nakarah, nails, locks, and chest hinges, for the doors of the natives turn on pivots; and they work almost entirely for native consumption. In towns men make 4 anas a day, in the country about half as much. Some few live entirely by making cages for birds, which are tolerably neat, and are composed of iron wire. The shoeing horses here, as everywhere else in India, is a separate profession. The shoe and nails are made by the blacksmith, but the Nalbund fixes them on. These farriers do not attempt to treat the diseases of horses, nor have I heard of any pretenders to the veterinary art.

Some people (tirgurs) still follow the profession of making arrows, which are not yet entirely exploded in Indian warfare, especially among the rude tribes of mountaineers that inhabit the wilds south from Gaya. The tirgurs purchase the heads from the blacksmith, 400 costing 1 r. They collect the reeds, which are of the kind called sar, and the feathers, and fit the whole. For 100 arrows they charge from 2 to $2\frac{1}{2}$ rs. The Kaseras deal entirely in making or repairing vessels of copper, brass, and bell-metal. The workmen of Daudnagar gave me the following estimate of their brass and bell-metal wares:—40 sers (44 s. w.), or 45 lbs. of brass, require $27\frac{1}{2}$ sers of copper, value 20 rs.; 22 sers zinc (justak), value 16 rs., and charcoal to the value of 8 anas; and, after being cast, the brass requires a man to beat it, whose hire is 1 r. The vessels are worth $46\frac{1}{2}$ rs., leaving a profit of 9 rs. The chief man does nothing but melt the materials, form the moulds, and cast; and seldom makes more than 40 sers in one month. The beating requires by far the most dexterity, but the man who does it is usually hired and paid by the job. A man of bell-metal vessels worth 42 rs. requires $38\frac{1}{2}$ sers of copper worth 28 rs., $9\frac{1}{2}$ sers of tin worth 5 rs., and charcoal worth 8 anas. The beater receives $1\frac{1}{4}$ r., leaving a profit of $7\frac{1}{4}$ rs., and one man seldom attempts to cast more than one man in a month;

but in some houses there are two casters. In Patna a few of them have capitals that would enable them to work to a larger extent; but they lay it out chiefly in purchasing vessels of the kind made at Kangtoya between Calcutta and Moorshedabad, which the people here cannot imitate, and few or no houses cast more than two maas a month. At Gaya their profits are at least equal to those at Patna and Daudnagar, and a man whose family consisted of seven persons, and who might therefore have two casters, said that his daily expenses came to 9 anas, which is $16\frac{1}{2}$ rs. a month. The goods made here are chiefly plates, cans without handles (lota) for holding water, and shallow pots, without ears, handles, or cover (tasta) for cooking.

Those who make tin leaf have some little capital, and their work is sent not only to all the places in the vicinity of Patna, but to Calcutta and Moorshedabad. They not only beat the tin leaf; but paint a great deal on one side with three bright colours, red, green, and yellow. The first colour is given with lac, the next with verdigris, and the yellow with turmeric.

Gold and silversmiths are called sonar, and the sonar forms a regular part of the manoral establishment, whose office is hereditary, and who weights the crops when a division takes place between the landlord and tenant, or when either of these sell to the merchant. By orders of the police the goldsmiths always work at home; but are watched by their employers to see that they do not adulterate the metals. The price for working silver is from one-sixteenth to one-fourth of the metal, according to the nature of the work; for working gold the price is from one-fourth to one rupee of silver for every rupee's weight of gold.

The Minamorussa give various ornamental colours to the precious metals. A great many of the gold and silversmiths cannot give their work any polish, but one man in Patna, called a soukari, lives by polishing their coarse work; and two other houses called jelagurs, live by polishing a kind of bracelet worn round the thick part of the arm, which is called bazu, is very much in fashion, and

is always polished. In Patna the making of gold and silver wire gives employment to three sets of workmen, and a considerable quantity is exported, besides a good deal that is required on the spot. The workmen have no capital, except their implements. Merchants furnish the materials, and pay them by the quantity of work. Although they are acquainted with the art of gilding silver wire, as practised in Europe; yet very little such is made, silver lace being chiefly in demand. The Tarkush form the precious metal into coarse wire, having previously gilded the ingot, if that is required. The Taniya draws the wire to the requisite fineness, and the Chapriyas flatten it, in which state it is called badda, is used either for forming lace or for weaving as an ornament into cloth, or for making cloth of gold or silver. The people who flatten the wire use the hammer with considerable dexterity, one blow never failing to render it of the proper thinness. These workmen make from 2 to 4 anas a day. The Tarkush of Bar make Badla of copper gilt or silvered, and go through the whole process.

The Tubukgur beat gold and silver leaf. They use deer skin, and preserve their leaf in paper books as in Europe. Some of them have capitals, purchase the material, and beat on their own account. Others work for merchants. They pretend that a great variety of herbs are requisite in their operations, but this is no doubt destitute of foundation; indeed, most of the workmen in Patna make a mystery of their art.

The Hukkah-Nugini, or jewellers, polish stones; but here they are seldom, if ever, employed on any material superior to rock crystal or pebbles, and those of Patna are much employed in polishing the bits of glass which the Minamorussas make into false jewels. The same workmen of Patna are a good deal employed in polishing the pebbles of the Son river for Europeans, as these stones are in little or no request among the natives. One house, however, at Gaya makes rings of this material, which are sold chiefly to pilgrims. The jewellers rub down and polish the stones on a wheel made of lac, and powdered corundum, and work

very well. From Europeans they get 4 anas a day, and furnish their wheel. The jewellers of Behar and its vicinity work in rock-crystal (phatik) alone. The crystal, which they procure in the hills, and which has been described in the account of the natural productions, is seldom of a size to make anything larger than beads like large peas, which are but very indifferently rounded or polished, although the workmen show very considerable dexterity in cutting them. They stick one end of the steel spindle into the ground, and place the crystal on the other end, which is very sharp, and then with a small hammer strike off all angles, a work which they do with great rapidity, and which requires as much dexterity as the formation of gunflints. A hole is then made through the bead with a common drill turned by a bow-string. The polish is said to be given by the long-continued agitation of a quantity of beads, thus formed, in a leather bag; but this part of the operation I did not see. A man usually makes 1,000 beads a month, which are worth from 8 to 10 rs., and the crystal may cost one-fourth part of this money, so that he has very good wages. The beads are chiefly purchased by the pilgrims of the Jain religion. When a large piece of crystal is found, it is made into a Lingga, and a few of these are made at Patna of crystal imported from the west, which is of a very good quality. It is bankers alone that deal in real jewels or pearls, and these are not cut here.

The Sungturash, or stone-cutters of Patna, are employed in completing mill-stones, the stones used for rubbing curry stuff, and for weights, all of which are brought in a rough state from Chandalgur (Chunar R.) and Rautas. They also import some plates from Mungger, to which they give a much higher polish than the workmen there can do. Those of Sahebgunj and Holasgunj have already been mentioned as architects and statuary; but as they have no employment in these higher arts, they have been reduced to make plates and cups from the sung-musa, or stone of Moses, a very fine potstone, of which I have given an

account in treating of the natural productions. The part of this colony from Jaynagar which has settled in Helasgunj, superintends the quarry and gives the vessels the first rude form. Those at Gaya turn them in the lathe, and give them a good polish. They are sold chiefly to the pilgrims from Bengal, where they are in great request, and are the handsomest vessels of the kind that I have seen, although they are quite plain. Each family may clear 7 or 8 rs. a month. In the decay to which the want of employment has reduced architects and masons, a family, which remains at Behar, has betaken itself to pare the hoofs of horses; for the horses there are not shod with iron.

The art of pottery is much on the same footing as in the district of Bhagalpur; that is, the potters make in general a very coarse unglazed ware, but owing to the quality of the clay most of it is strong. A few make Sorahis for cooling water, such as I have described as being made at Mungger, and they also make a wider mouthed vessel called Jagar, which cools water. Tiles for the roofs of houses are a considerable part of the potter's work. They are of two shapes. One flat with both sides turned up, the other formed by cutting a hollow cylinder longitudinally, and thus making two tiles. Each tile in the lowest row of a roof has on its under side a knob, by which it is prevented from falling, but the others beneath are quite smooth, and are supported by those of the lower row, owing to which they are very easily displaced, and the roofs are generally leaky. The flat ones, if good, sell at Patna for two rupees a thousand, and cannot be used alone. They are laid in rows with their turned up edges parallel to each other, and these edges are covered by rows of the smaller semi-cylindric kind, inverted over them. The semi-cylindric kind sell at Patna, if good, for half a rupee a thousand. They may be used alone, by first covering the roof with them placed on their convex sides, and then placing over these another layer disposed in a contrary position. The very light potters' ware, mentioned by Buffon, as made at Patna, is no longer known there, and I presume

has merely been purchased at that city, and has come from some other part of India. Some such I have seen at Bombay; but it had been brought from Bussorah. In the account of the natural productions, I have mentioned the attempts of Mr. Law to make procelain of a calcareous marl; but, as might have expected, the manufacture was immediately abandoned. At Bar some potters make vessels for the use of the Muhammedans, that have a kind of enamel, and may be kept clean by washing. They put the ware three times on the wheel. At the first it is formed, at the second it is smoothed, and at the third it is curved. It is then covered with a pigment made of Kharimati (porcelain clay), Sajimati (impure carbonate of soda) and oil cake in equal quantities, mixed with a sufficient quantity of water. When dried, from five to seven vessels are put into a large unglazed earthen pot, (Matka) the mouth of which is covered with a plate and luted; four or five of these pots are placed in the ordinary kiln, and burnt as usual. The enamel is of the most beautiful white, but the work is very coarse.

Many potters in the country make rude playthings for children; but in some towns there are people who make these chiefly, and do not deal in common pots; but besides the toys they make the implements used in smoking, and the finer bottles and vessels used for cooling water. The toys are often painted with gaudy colours, especially white, which is done with mica (Abarak) or porcelain clay (Khari).

At the principal towns are some persons who deal to a considerable extent in making bricks, contracting to supply all that is wanted for any building. They are called Puzayahs, and take no share in the manufacture farther than to employ the workmen, to advance money, and to procure the ground for clay. For this they pay an annual rent to the owner. People of a certain class form the bricks, and at Patna and Sahebgunj at least use the moulds; and it is these alone that have been entered in the tables as brickmakers. At Sahebgunj the bricks are 9 inches long, 5 broad, and

about 2 thick. Before going into the kiln they cost 28 rupees for the lac (1,00,000). Workmen of another class burn the bricks, and collect fuel, for which they not only use wood, and the thick stems of various crops, but also cow dung and every kind of excrement. These people contract to deliver the 1,00,000 burnt bricks at 125 rupees, and pay those who mould them. In works, that have been done by the Company the dealers (Puzayahs), on account of an extensive sale, and prompt payment, have been contented with 156 rupees for the 1,00,000 bricks, but take somewhat more from common employers. At Patna the Puzayahs find fuel, and employ servants to burn the bricks; but buy them ready for the kiln from those who mould the clay.

The bricklayers are far from being good workmen. Their plaster in particular is badly compounded, and quite new houses often leak with the first shower. Common workmen are allowed from three to four rupees a month; principal artists often receive double.

Lime is generally prepared by people who deal to some little extent, and who employ labourers to collect and burn the materials, which are both shells and calcareous nodules. At Patna the former are chiefly employed, and are brought from the north side of the Ganges. A few of the dealers there have considerable capitals (2 or 3000 rupees), and import some lime from Rautasgar. At Behar, those who burn lime, purchase the raw material from persons who collect it. A kiln requires 14 mans (about 1150 lbs.) of calcareous nodules, which cost 1 rupee, and 3 mans of charcoal, which cost as much. In three days the lime is burned, and is powdered in wooden mortars, while unslaked. The lime procured in this state is 8 mans (about 660 lbs.) worth $2\frac{3}{4}$ rupees. The people who burn it are the soap makers; and I have already stated, that much reliance cannot be placed on their accounts of profit and loss.

Section III. of the manufacture of Thread, Cloth, Tape, Strings, &c.

Cotton as usual is by far the most common material used in the cloth manufacture of these districts; and a great part of what is used is the produce of the country. Of this a great deal is freed from the seed by the women who spin it, and a part of this is also beaten by the same persons; but the Dhuniyas, who make a profession of cleaning and beating cottons, separate the seed from some, and beat the greater part. Perhaps one-third of them have stock enough to enable them to buy a little cotton, which they clean, and then retail. The remainder works entirely for hire. A man and his wife can make from 3 to 4 rupees a month. In country places they are very often paid in grain. At Arwal they are allowed $1\frac{1}{2}$ sers of grain for beating 1 ser of cotton, and in one day a man beats 4 sers (45 s. w.) equal to about $4\frac{1}{2}$ lbs. and of course receives $6\frac{3}{4}$ lbs. of grain. Those who have a little capital, may make 4 or 5 rupees a month.

In every division I procured an estimate of the proportion of women who spin cotton, of the average quantity of cotton that each spins, and of the value of the thread. Such estimates are liable to numerous objections; but it is probable, when a number of them are taken, that the errors of the one will be nearly corrected by those of the others, so that the average will not be far from the truth. Allowing that the women of an age fit to spin are one-fifth of the population, the estimates, that I procured, will give for the whole thus employed 3,30,426 spinners. Now by far the greater part of these spin only a few hours in the afternoon, and upon the average estimate, the whole value of the thread that each spins in a year, is worth nearly 7 rs. 2 anas, 8 pies, giving for the total annual value 23,67,277 rs. and by a similar average calculation the raw material, at the retail price, will amount to 12,86,272 rs. leaving a profit of 10,81,005 rs. for the spinners, or $3\frac{1}{4}$ rs. for each. But there are many women who spin assiduously, and who have no

interruptions from children or family, and these make much more, especially where the thread is fine; there being no sort of comparison between the reward allowed for such, and that given to those who spin coarse thread. As the demand therefore for fine goods has for some years been constantly diminishing, the women have suffered very much. Another calculation agrees so well with the above, that I have little doubt of the general accuracy of both. An estimate was made in each division of the number of looms employed, of the quantity and value of thread required annually for each, if employed in working at the usual rate, and the most common kind of goods, and the following is the result.

Cotton thread required for cotton cloths, 22,29,979 rs.; do. for mixed cloths, 1,01,762 rs; do. for tape and carpets, tent ropes, &c. 37,125 rs.; do. for sewing thread, &c. 2,000 rs.—Total 23,70,866 rs.

Some thread is both exported and imported. Taking the amount at the statements which I received, the excess of that imported will be worth 30,500 rs., which would reduce the demand on the thread of this district to about 23,40,356 rs. in place of 23,67,277 which I have allowed to be spun; but at Bhagalpur it was said, that 1450 rs. worth of thread was there imported from Patna, and at Puraniya there is imported to the value of 12,200 rs. of which a half probably comes from the same town, while the merchants here only allowed an export of 3,420 rs. This difference, however, is of no great importance, and the results of the two calculations agreeing within one-eighty-seventh part form a coincidence as near as can be possibly expected. It must not however be denied, that these results were contradicted by another statement, founded on the quantity of raw material said to be used. The cotton said to be produced in the country is only valued at 1,75,000 rs. but this is the harvest wholesale price, and the retail price will probably be 30 per cent. higher, giving in all 2,27,500 rs. The cotton merchants of Patna state their imports from 10 to 12,000 mans, but 1000 must be allowed to be used in stuffing mattresses

and quilts, leaving about 10,000 mans for thread, and at the retail price these are worth 1,60,000 rs. giving thus 3,87,500 rs. of raw material, in place of 12,86,272. As the quantity required for thread seems in no manner exaggerated, and as the quantity of cotton produced in the country has probably been stated with tolerable accuracy, I must infer, that no dependence is to be placed on the reports of the merchants concerning the extent of their trade, of which indeed we shall find sufficient evidence, when we come to treat of the exports and imports. I am informed by Mr. Vansilart, the custom master, that when town duties were formerly levied on cotton, the quantity usually imported in one year was valued at about 3,50,000 rs. and the valuation having been at 10 rs. a man, this gives 35,000 mans, in place of 11,000. In this case there would remain for spinning 34,000 mans, which at the retail price would give 5,44,000, making the cost of the whole raw material 8,71,500 rs. The whole thread is spun on the small wheel common in India, and the implements for cleaning and beating the cotton are not different from those that are usual. No rank here is considered as degraded by spinning.

The dyers in these districts are divided into four kinds, Rungrez, Nilgur, Ach furosh, and Galalsaz. The first dye various colours, the second dye with indigo alone, the third with the root of the Morinda alone, and the fourth with lac alone; but some of the first class use both indigo and morinda. I have procured nothing new concerning the processes that are used by these artists, and shall confine myself to mention what the Golalsaz say concerning the manner in which they extract the dye from lac, a subject of considerable importance, as a vast saving of freight may be had by exporting the dye thus prepared, and the shell lac, when both are separated from the sticks, to which the lac naturally adheres. A good deal of the dye thus prepared is sent to Calcutta, but owing to the purchasers being natives, it is not of the best quality; for the native merchants almost universally run upon whatever is cheapest. The dye thus

prepared is called Golal. To make the best kind, take 40 sers (80 s. w.) or 82 lbs. of stick lac, (value 12 rs.) beat it in a mortar, and put it into 36 sers of water for three-quarters of an hour; then, for an equal length of time, tread with the feet the lac and water, and pour off the water or infusion. Then the lac is put into an equal quantity of water and treated in the same manner, and this is repeated a third and a fourth time; the whole infusion is then boiled to two-thirds, and then are added 20 sers of sour curdled milk, (value eight anas); the whole is then put gradually into a cotton cloth bag and strained. This takes two days, after which the bag and what remains in it, are squeezed with a heavy weight and made into lumps about the size of a filbert, which amount to $1\frac{1}{4}$ ser, worth $3\frac{1}{4}$ rs. The lac is then melted and cast into little cakes, of which there are 20 sers, worth 10 rs. Total produce, 13 rs. 12 anas; the materials are 12 rs. 8 anas, and fire-wood costs 4 anas, leaving 1 rupee for profit. For the Golal of an inferior quality usually sent to Calcutta, 5 sers of Tikhur or starch, prepared as already mentioned, value 1 rupee, are added along with the milk, and 6 sers of the Golal are produced, worth $5\frac{1}{4}$ rs. The best, in fact, is only made when required for dying silk on the spot. The Rungrez are employed much as in Bhagalpur, and make good wages. At Gaya, a family in which there were two adult men, and in all eight persons, cleared, I was told, 120 rs. a year. The indigo dyers are paid by the weight, and give a full blue colour to 5 sers ($9\frac{3}{4}$ lbs.) of cotton thread for a rupee.

The weavers, who make cloth wholly or in part of Tasar, silk, are confined to three vicinities, Phatuha, Gaya and Nawada. At the first are made four qualities of goods: 1. Banusa 18 cubits long by $2\frac{1}{7}$ cubits wide, and) consisting of Tasar and cotton warp in stripes, with cotton woof. This cloth is used for women's petticoats. The piece sells for about one rupee. 2. Maghaiyas 10 cubits long by $1\frac{1}{4}$ cubit wide, value usually 12 anas. It differs from the Banusa only in size, and is used by women for a wrapper. 3. Lunggi serves both

as wrappers and petticoats for women, and is 13 cubits long by $1\frac{1}{2}$ cubits wide. The whole warp is Tasar, the woof is partly Tasar, partly cotton; the piece usually sells for 13 anas. 4. Sela, entirely of Tasar, is made of the same size with the Lunggi, and both serve the same purposes. The piece usually sells at $2\frac{1}{4}$ rs.

At Gaya they make some Selas, but the great article is the Manpuridhuti, which is in great request with the Mahratta pilgrims, who purchase almost the whole. A piece sells for $2\frac{1}{2}$ rs., is 18 cubits long by 2 wide, and consists of cotton with Tasar silk borders.

At Nawada, the cloth made is called simply Dhuti, and is of the same nature with the Manpuridhuti; but the pieces are worth only 9 anas each, being 8 cubits by 2. On making an estimate of the number of looms and number of pieces wrought, I find the following result:

	Cocoons, value.	Cotton thread, ditto.	Value of Cloth.	Total Profit.	Do. each Loom.		
					Rs.	As.	P.
Phatuha	1,81,758	76,100	3,71,250	1,13,392	90	13	0
Gaya	5,625	18,750	37,500	13,325	52	8	0
Nawada	2,016	6,912	12,960	4,032	33	9	7
Total	1,89,399	1,01,762	4,21,710	1,30,749			

Each loom requires one man and woman, the latter to wind, and to assist in warping and dying. At Phatuha about 50 old women are employed to wind and sell the silk thread, called there Tasar, while the cocoons are called Koya. A woman in one month can wind $8\frac{1}{2}$ pons, or 688 cocoons, value $3\frac{1}{4}$ rs.; each pon gives about $1\frac{1}{4}$ Chhatak (76 s. w. a ser), therefore $8\frac{1}{2}$ pons will give s. w. $50\frac{47}{100}$; but 12 s. w. of the Tasar sells for 1 rupee, therefore the s. w. $50\frac{47}{100}$ are worth 4 rs. $3\frac{1}{2}$ anas, leaving a profit to the spinner of $7\frac{1}{2}$ anas. At the above rate a pound avoirdupois of Tasar silk would cost nearly $3\frac{1}{4}$ rs., the material at present being dear. The operation of winding is performed in the same manner as at Bhagalpur, only no potash is used, which, although it no doubt facilitates the operation, may spoil the texture of the silk.

The cotton weavers are numerous; those of

Phatuha are employed in weaving cotton diaper (Khes), which the natives use as a dress; but the great demand is for Europeans, who use this manufacture for table linen. The table-cloths (Chaddur) are made of four dimensions: first, 20 by $4\frac{1}{2}$ cubits, common value 10 rs.; second, 9 by $4\frac{1}{2}$ cubits, common value 3 rs. 8 anas to 8 rs.; third, $4\frac{1}{2}$ by $4\frac{1}{2}$ cubits, common value 3 rs.; fourth, $4\frac{1}{2}$ by 4 cubits, common value 1 rupee, 3 anas; towels $1\frac{1}{4}$ by $1\frac{3}{4}$, common value by score 2 rs. 8 anas. The total number of looms employed in this manufacture is stated to be 750, and in the statements which I received, it is supposed that each makes cloth to the value of 60 rs. a month. The whole annual value of this manufacture is therefore about 5,40,000 rs., of which the thread costs 4,58,600 rs.; so that each loom has a profit of $108\frac{1}{2}$ rs. a year, but three persons are employed, the Lungri pulls the threads to form the pattern, the Dobarah twists the thread, and the Binkarai weaves.

By far the greater part of the other cotton weavers is employed in making coarse cloths for country use, but a good many work at finer goods for exportation, the Company having had three factories dependent on Patna, and five subordinate to the other three, while native traders have established 22 houses for the purchase of cloth. As the greater part of the cloth made in every division is coarse, and as my estimate is founded on the kind of which the greatest quantity is made in each division, it is principally applicable to the coarser goods. According to the statements I thus received, the amount of thread required is 17,71,379 rs., and the value of the cloth 24,38,621 rs., leaving a profit of 6,67,242 rs. or $28\frac{1}{4}$ rs. for each loom. It may be supposed that the finer qualities of goods taken for exportation would diminish the value of raw material, and increase the total value of the commodity; but that would not appear to be the case. Although the quantity of thread is no doubt less, yet, as the reward for spinning fine is much higher than that for spinning the coarse, the actual value is perhaps a little higher than I have stated, and may reduce the average profit to 28 rs. a year

for each loom. Further, it would appear, that the system of advances, and a good deal of the fine cloth is made on advance, produces its usual consequences; and the workmen, becoming indolent, do not make to a greater value than they do when working at coarse goods for ready money sale. In order to explain these matters, I have given four estimates in the Appendix explanatory of this manufacture; one of which is made up from the report of the weavers, founded on the species of goods most commonly made in each division; the other three are from the report of the Company's native agents, men in general very intelligent and well-informed, and, I believe, that the report with which they furnished me was made up by Mr. Brown, lately commercial agent at Patna, a gentleman upon whose accuracy much reliance may be placed. Previous to his time a gentleman, whom the natives call Belver (probably Barber), had entered into engagements with 2,200 of the best weavers in the country round Jahanabad, including that division, Holasgunj, Sahebgunj, and a few perhaps in Vikram, Arwal, Daudnagar, and the corner of Ramgar, next to that town. Each man on becoming bound (Asami) to the Company received two rupees, and engaged not to work for any person until he had made as the Company required; and no other advance has ever been made by the commercial residents. The agent orders each man to make a certain number of pieces of such or such goods, and he is paid for each on its delivery, according to the price stated in the tables. This shows clearly that the system of advances is totally unnecessary; but it is here pursued by all the native dealers, as keeping the workmen in a state of dependence little better, if so good, as slavery.

The loom is of the imperfect structure usual in India, and where starch is used to facilitate the working, it is made from the root called Kandri, which is mentioned in my account of the natural productions of Bhagalpur. It must be observed that all Indian weavers who work for common sale, make the woof of one end of the cloth coarser than

that of the other, and attempt to sell it to the unwary by the fine end, although every one almost who deals with them is perfectly aware of the circumstance, and although in the course of his life any weaver may not ever have an opportunity of gaining by this means. The same desire of illicit gain induces him almost universally to make the pieces somewhat shorter than the regular length. Stamp masters, such as superintend the linen manufacture in Scotland, would probably be found a check against these evils, which are quite the reverse of contributing to the real advantage of the weaver; but the power requisite to be vested in such persons could not, I doubt, be given to any persons to be found here without producing greater abuses than those which stamp-masters could remedy.

The coarse goods made for market sale are always sold as they come from the loom, but that intended for sale is all bleached, of which I have already given an account, and much of it undergoes operations by different classes of tradesmen. It must be observed, that in these districts the weavers were bound to act as porters for conveying the goods of travellers; and when any person of rank or authority calls upon the Zemindar for such, the weavers are still required to perform this office. On some estates they are on this account allowed an exemption from ground rent for their houses; on others they are taxed at a higher than usual rate.

In most places the washermen smooth the bleached cloth with a beetle; but in Behar the people who perform this operation are of a distinct profession, work at no other, and are called Kundigars. At the same place a class of artists called Parchahkush, is employed to put all the threads in the bleached cloth at equal distances: the cloth made there being very thin, the operation of bleaching brings the threads into clusters, leaving many parts almost in holes. Three workmen place all the threads at equal distances with a wooden comb. In some other places a needle is used, and the workmen are called

Nardiyas. Many fine pieces of cloth are ornamented at the ends with the flattened gold and silver wire called Badla, which, as the natives use the pieces entire, looks very showy. It is not woven into the cloth, but put in with a needle. The Badla made at Patna is too fine for the purpose, and is only used for making lace or thread for embroidery; and what is used in the cloths of Behar is probably only copper-gilt or silvered; some such is made at Bar. In each piece of the Tunzebs or muslins of Behar, the pieces of which are two cubits wide, the Kangnigars, who perform this operation, stitch from five to seven bands of this Badla, each consisting of 350 wires. The workmen receive four anas for the 100, and a man can daily put in from 50 to 70: allow that he puts in 60, and works 26 days a month, he will receive about 4 rs. ($3\frac{9}{16}$), and 3200 cubits of the wire costing 1 rupee, he has about $3\frac{7}{16}$ rs. a month for profit.

At Patna are a few women (Buta banwaiyas), who flower cloth in the same manner as is done at Maldeh, of which I have given an account when treating of Dinajpur. The Chhapagars put gold and silver flowers on fine muslin by a very simple process; they stamp the cloth in the form wished, with common glue, and then apply gold and silver leaf, which adheres to the glue, and rubs off where that has not been applied. Of course this cloth cannot be washed, but is very showy, and is used only on high occasions.

Except at Patna, most of the chintz makers work entirely for country use, as described in the districts hitherto surveyed, and the men here use a good deal, but women seldom appear in such a dress. The workmen of this kind have not regular employment, but make about 5 or 6 rs. a month. Two men can in one day print a piece of calico, for which they get a rupee; but the drugs cost one-half of the money. If the employment were constant, this would give each 7 or 8 rs. a month. The tradesmen of Patna make chintz for exportation, and use new cloth. Some of them have a little capital, find the materials and servants, and print the cloth at so much a piece

for the merchants, who export it; but none can purchase the calico, print it, and stand the sale of the chintz. A great many, indeed, cannot find the apparatus, and work as mere servants to the merchant, who furnishes every thing. I did not learn their processes. Most of the chintz is exceedingly coarse, and is taken by the Portuguese and Americans; nor is the finest equal to what comes from Lucknow or the city of Calcutta, much less to what is made in Europe.

The Newargars weave cotton tape; I have nothing new to offer on this subject. Two houses at Sahebgunj knit mittens of cotton. The carpet weavers make three kinds of goods. One is the common Sutrunji, made entirely of cotton; and another consists of Sutrunjis, of which the warp is cotton and the woof woollen, but striped and worn in the same manner with those made entirely of cotton. The loom employed in weaving both these is horizontal, with either treadles or reed, and the warp is stretched out the whole length and breadth of the piece intended to be wrought. The woof is not thrown across with a shuttle, but is passed through by several workmen, who bring the threads close together with wooden combs in place of a reed. The narrowest piece requires two men, and 8 or 10 are often employed at this awkward labour. The third kind resembles the Wilton carpets of England, and consists of a woollen pile wrought into cotton warp and woof: these carpets are very handsome, and the workmen put in the pile with great dexterity, and form the flowers very neatly without looking at a pattern. The warp is placed vertically, and the various coloured worsted hangs down from bobbins between the warp and the workmen. The woof is passed by the hand and driven home by the comb. The carpet makers of Daudnagar, originally from Delhi, are the most skilful, and seem to be in easy circumstances, and in one shop I found 16 men weaving, besides dyers and spinners. The carpets made for common sale are $4\frac{1}{2}$ cubits long and $2\frac{1}{2}$ broad, and are used by the natives for bedding, or for a seat. When large

ones for covering the floors of rooms are wanted by Europeans, they must be commissioned. The small carpets sell usually on the spot at $1\frac{1}{16}$ rs.; each requires 1 ser of cotton thread = $4\frac{1}{2}$ anas, wool 4 sers = 1 rupee, dying 4 anas, this is done by the weavers, and it is spun by their women; two men finish two pieces in three days, or about 52 pieces a month, and these are worth $97\frac{1}{2}$ rs. : the materials and dying drugs will cost $79\frac{1}{16}$ rs., leaving a profit of $17\frac{1}{16}$ rs. for the work of two men and probably two women. At Patna the following estimate was given concerning the common cotton sitrinjes, usually the same size with the small carpets; each requires one ser thread (76 s. w.) worth $10\frac{1}{2}$ anas, and dying $1\frac{1}{2}$ ana; the value is 18 anas, two men make one piece in two days, and each has only $1\frac{1}{2}$ ana a day profit.

All the blanket weavers, as in other districts are shepherds. The 50 houses in Daudnagar were said to make annually 3,000 blankets, and at this rate the whole in these districts would make only 33,840 more than which are used in the country; but everywhere in Bengal the blankets in use, are alleged to come from Patna. At that city however, no such thing is acknowledged, and 2,500 rs. worth of blankets are said to be annually imported, while only 7,050 rs. worth are exported. Another estimate procured at Jahanabad would give rather a greater return. A man weaving and a woman spinning can in four days make a blanket five cubits by three, and worth one rupee. Allow that they work 26 days in the month, they will make 78 blankets a year, worth 78 rs. Each blanket requires $4\frac{1}{2}$ sers (at 52 s. w.) or 6 lbs of wool, worth 12 anas, so that the man and woman earn only $19\frac{1}{2}$ rs. a year; but every man has sheep, and the value of the wool goes towards his subsistence, the wethers sold probably pay every charge.

At the rate here stated, the numbers of weavers would make 43,992 blankets of the best quality worth an equal number of rupees; but as many smaller are made, and as the average value does not exceed 12 anas, we may suppose,

that the actual number made may be about 58 or 59,000, and this would require much more than the wool, which the sheep estimated to be in these districts could produce; especially as some is used for carpets. The wool of all the sheep, young and old, is used intermixed.

The Tashbaf weave cloth of gold or silver; the latter is by far the most common. The warp is proper silk, the woof is the flattened wire called Badla. It is not figured. It is chiefly used by rich men for sashes, or mantles to throw round their children's shoulders. The pieces are from three to eight cubits long, and from one to two cubits wide, and sell from 5 to 30 rs. The Gotasaz make gold and silver lace of the same materials. It is mostly sent to Calcutta and Moorshedabad, where it is considered inferior to that from Europe, or even to that of Benares, but it is superior to that from China. It is of two kinds, Kenari which is from 1 to 3 inches wide, and Gota which is from one-eighth to seven-eighths of an inch broad. Some of the lace, which they make is of copper-gilt, or silvered by the workmen of Bar.

The Batwaiya or Kalabatu make gold and silver thread, twisting the flattened wire (badla) round silk. This is sent to Moorshedabad, Calcutta and Dhaka, and is used by embroiderers, and those who flower muslin. The Alakbands make little strings and tassels, that are ornamented with gold and silver, and often with pearls and jewels, and are usually hung to the handle of the daggers, which natives of rank wear in their girdle. Individuals carry these ornaments to different parts, but merchants do not export them on a large scale. The Patwars knit strings as usual in other districts, and make also fringes. They use not only the proper silk, but also that called Tasar, and even cotton. Those of Patna are reckoned very good workmen. The Nakads wind and twist the silk to render it fit for the use of the Patwars, and the makers of cloth of gold and silver, of lace, and of gold and silver thread. The winding is rather difficult, as the hanks and clews of raw silk, as prepared by the natives, are exceedingly ill

contrived; and no one, who is not expert, can take off one yard without breaking.

The Kangjar make ropes of the grasses called Sabe and Muj. They twist them by means of two cylinders turned by a string, first drawn one way and then the other, but the cylinders turn always in the same direction. This is a motion, although known in Europe, not much used there, and which at first sight appears very extraordinary. The Kangjars mentioned in the list have obtained a fixed residence; but the people of this profession are in general vagrants, and many such are constantly travelling through the country, at least in fair weather.

Section IV. Of the Manufacture of Sugar

In every part of these districts several of the confectioners prepare the kind of coarse sugar called Shukkur, which in fact is entirely similar to the Muscavado sugar of Jamaica, and is prepared by putting some of the thin extract of sugar-cane into coarse sack cloth bags, and by putting a weight on these to squeeze out the molasses. According to the care with which the operation is performed, the Shukkur amounts to from one-half to twenty-five fortieths of the whole. At Behar, where the thin extract was worth $1\frac{1}{4}$ r. for 40 sers, or 82 lb. nearly, and where this quantity gave 25 sers of Shukkur, these were valued at $18\frac{3}{4}$ anas, and the 15 sers of molasses were valued at $5\frac{1}{2}$ anas, so that for performing this trifling operation the workmen had a gain of $4\frac{1}{4}$ anas, and the Shukkur sells for about 2 rs. 8 anas an hundred weight.

At Behar there are 15 houses of the Mahuri tribe, where refined sugar is made by placing 25 sers of the Shukkur in a basket, and on the surface is laid some of the aquatic plants usually employed to refine sugar. In this district the *Valisneria spiralis* is not so common as in Bengal, but is always preferred, when it can be procured. When it cannot, the *Serpicula verticillata* of Dr. Rox-

burgh, and several *Potomogetons* are used. After standing three days, about $2\frac{1}{2}$ sers of refined sugar are scraped from the surface, and more plants are applied, and this is repeated, until the whole Shukkur has been exhausted. From the 25 sers of Shukkur, it is alleged, that on an average there are procured eight sers of this raw sugar worth 14 anas, and 17 sers of molasses worth six anas, so that the profit on the operation is $1\frac{1}{4}$ ana. It can only be performed in the heats of spring. It is alleged, that the whole of the raw sugar made by these 15 houses amounts to about 300 mans, and that the Shukkur sold, is worth 7,000 rs. At this rate the quantity of Shukkur will be $1,49,334\frac{1}{2}$ sers, which will require rather more than 5,973 mans of extract worth $7,466\frac{1}{4}$ rs. and the profit will be about 1,585 rs.; and there will be also procured 2,240 mans of molasses worth about 2,053 rs. Farther the 32 mans of raw sugar worth $1,287\frac{1}{2}$ rs. will require 1,500 mans of extract worth 1,875 rs. of which 1,200 mans will be molasses worth about 1,058 $\frac{1}{2}$ rs. leaving a profit of 471 rs. The whole profit of the 15 houses being therefore 2,056 rs. each will have 137 rs. which seems to agree with appearances. Most of this sugar is consumed in the vicinity, and is purchased as made by petty traders, who dispose of it at the weekly markets, nor are any advances made either by these or to the farmers, who rear the cane.

Neither are any advances made by the sugar makers of Kelsa, who prepare their sugar (Chini), by boiling, who are more wealthy men than those of Behar, and whose works are called Kolsar or Godam, of which there are 20. They give me the following account of the manner in which they manage 10 mans (400 sers, or 321 lbs.) of extract, which is probably less inspissated, than that in the vicinity of Bar, as it gives only one-half of its quantity of Shukkur, and sells one-fifth cheaper; so that in order to form Shukkur, the extract is first squeezed in coarse bags of sackcloth, containing each about 40 lbs. It is afterwards squeezed into bags of strong cotton cloth, containing each about 30 lbs. Of the Shukkur 1 man (82 lbs.) is

put into an earthen vessel, with about 41 lbs. of water, and boiled for about 24 minutes. About this time a froth has arisen on the surface, and then 4 lbs. of milk and 8 lbs. of water are gradually added, while the liquor continues to be boiled for three hours. It is then strained through a cotton cloth spread on a basket, and the strained liquor is called *Sira*, from whence perhaps our word *sirup*. The *Sira* is again boiled for about 24 minutes in small earthen vessels, each containing from 4 to 6 lbs. The contents of the whole are emptied into a large earthen cooler called a *Nad*, which has in its bottom a hole, that is plugged with a bamboo. After the liquor has stood two or three days in the *Nad*, the bamboo is pulled up, and the treacle is allowed to flow for two days. The aquatic plants are then applied two fingers thick, and in two days there are cleaned about 6 lbs. of sugar, which are scraped off, and the plants again applied. Three mans (246 lbs.) of boiled liquor in one cooler give 1 man of sugar, and 2 mans of treacle, and require 30 days to be exhausted. The sugar forms into grains, that in this country are considered too large for sale. It is therefore reduced to a fine powder by putting it in a bag, on which a man treads with his feet. Each factory in a month may make about 100 mans of pot extract into sugar, and the expense and profits are said to be as follows :

To 100 mans (8234 lbs) of extract, 100 rs.; to ox hire for bringing it to the works, 2 rs.; to earthen pots, 2 rs. 6 anas; to fuel (cow dung), 4 rs. : to two labourers, 4 rs.; to milk, 2 rs.; to aquatic plants, 2 rs.; to house rent, 2 rs.; to bags, 1 r.; to profit, 29 rs. 10 anas—Total, 149 rs. By 50 mans molasses (*Chhoya*), 27 rs.; by 30 mans (*Garuya*) treacle, 20 rs.; by 17 mans sugars 102 rs. —Total, 149 rs.

They only work five months in the year; so that each house will gain 148 rs.; but they also make a good deal of *Shukkur*, although the exact quantity I do not know, and they make a small quantity of a coarse sugar called *Bura*, the process for which I did not learn. Their gain however,

is not less than 160 rs. a year. The sugar is considered as somewhat inferior to that made in Dinapur. It is not adequate to the consumption of these districts.

The confectioners make some sugar candy but I did not learn the process.

Section V. On the Manufacture of Indigo.

On this subject I have nothing new to offer.

Section VI. On the Manufacture of Salts.

Of the saline substances manufactured here, the most important by far is nitre. In the account of the natural productions, I have mentioned the circumstances under which the saline earth is found; and the mixture of muriate of soda and nitrate of potash, which usually prevails in the saline matter, that nature prepares, has given rise to an idea, that the same brine can be converted either into the former, or into the latter according to the manner in which it is boiled.

Mr. Galdwin, the Commercial Resident at Patna, had the goodness to desire his people to show me the whole processes, and by this means I was able to trace what had given rise to such an opinion. The workmen pretend, that, according as they please, they will from the saline earth as scraped in the villages make either nitre alone, culinary salt alone, or both. With regard to the two former there is little difficulty, because by the taste they can ascertain what saline efflorescence contains much nitre, or what contains much culinary salt; but when they asserted, that of two portions of the same brine, they would make the one into nitre and the other into culinary salt, I was much puzzled, and desired them to go through the process. They accordingly selected saline earth, which contained both the salts, and in the

usual manner procured from it a dirty brine, such as is commonly made in the operation for obtaining nitre: this was divided into two portions; the one intended to be made into culinary salt was evaporated until near dryness, when it became soft like clay; and when cold, it formed a dirty saline mass, that deflagrated on the coals without any decrepitation; but still the quantity of muriate of soda that it contains, render it eatable. The other portion of the brine was only evaporated until it showed a tendency to crystallize when dropped on a plate, and was then strained through a cloth and placed to cool, when of course the nitre shot into fine crystals. The brine which remained, on being evaporated to dryness, gave a salt much freer from earthy impurities than what was called culinary salt, and it contained a greater proportion of muriate of soda, as when placed on burning coals it not only deflagrated, but decrepitated. In fact, by the usual process employed in making nitre, this brine would have been again boiled and cooled twice, and then the nitre having been mostly separated, the remaining brine would have contained an almost pure muriate of soda, and this in fact is usually procured by the workmen who make nitre, while the muriate that is formed during the first boilings, is removed as it falls to the bottom of the vessels. I am assured that the culinary salt thus procured is at least equal in quantity to the nitre, and sells for double the price given by the Company to the workmen for that article. Besides, several other saline earths are found in the province of Behar, with which the salt from Calcutta is supposed to be adulterated.

The ideas on this subject must however continue vague and erroneous, and attempts to prevent fraud may consequently give rise to ineffectual and oppressive regulations until there is employed a person qualified by his chemical knowledge, and provided with authority sufficient to secure a full investigation of the subject, for the question is totally beyond the reach of a magistrate or of a commercial resident. If it is not

expedient to give such powers to a man of science, a civil servant of the Company may be invested with the necessary powers, and having with him a man of science to give the evidence resulting from scientific investigation, may conduct the parts of the inquiry that require the exertion of judicial authority. Some such mode of investigation I would recommend to be made without loss of time, as the frauds that are made at present, by mixing with the salt from Calcutta saline substances which have paid no duty, are carried to a very considerable extent, and are highly injurious to the fair trader.

When I travelled through these districts, the manufacture of nitre was free and the Company procured very little. It has since been made a monopoly, on terms which I am told are rather hard, and that will of course lead to much contraband, both in the nitre itself and in the other salts which are made by the same people. I do not certainly think that in such an article a monopoly on the part of government may not be perfectly justifiable and expedient, but while such a monopoly is established, the reward to the labourer should be liberal; otherwise the temptation to contraband becomes irresistible. So far as I can judge at present, until such an investigation as I have above mentioned takes place, the whole manufacture of these saline matters should be included in the monopoly and placed under the commercial resident, who should allow a fair price to the labourer, and sell none of them that can be possibly mixed with ordinary salt at a lower price than that substance usually brings at Calcutta. The demand of the natives for nitre, both for gunpowder and fireworks, is very considerable, and might become a source of revenue, could the people who make these articles be prevented from making the nitre; but this will require some severity, as in most villages every wall contains nitre, and the Atushbaz may collect the saline matter in the yard surrounding his house and boil it into nitre in his kitchen. It will be therefore necessary to impose heavy penalties on all such

as boil any saline earth into salts, except in public furnaces belonging to the Company's manufacturers.

What I shall here say concerning the manufacture of nitre applies to its state before the establishment of the monopoly. The Company in these districts purchased part of the nitre, after the second boiling, when it is called Kulmi, in which state it is transmitted to Europe; but still a greater part was purchased after the first boiling and was boiled a second time by workmen, whom the agent employed, and these also made some nitre of the first boiling from the heaps of earth that have accumulated in the progress of refining. The low price given by the Company has induced the workmen to practise every species of adulteration and to neglect one of the most simple and effectual operations, that of straining the boiled ley before it is exposed to crystallize. This has been totally abandoned, and the nitre of the first boiling usually brought to the factory is of course mixed with much clay and muriate of soda, which that very simple operation and trifling expense would have removed. The plan of giving the second boiling in the Company's factories seems however preferable, as the operation is there rendered more complete by the use of proper coppers, which are totally beyond the reach of the native manufacturers; but the process does not seem to be judicious.

The following is the manner of refining the nitre at the Company's chief factory;—About 15 mans (600 sers) of crude nitre are put into a large copper vessel containing 50 pots (gharas of 15 sers each) of boiling water. When dissolved, the brine is taken out with small earthen pots suspended by strings, and poured into large earthen vessels, which contain each about 6 gharas. In these it stands about an hour to allow the earth to subside. The clear brine is then put into earthen pots (nads), containing each about 45 sers, where it remains a day, but no more clay subsides. The whole is then emptied into the copper, and boiled about $2\frac{1}{2}$ hours. To the hot liquor are then added

30 mans of crude nitre, and, when dissolved, the whole is put into the pots, where it stands about 24 minutes, during which it is scummed and the earth is allowed to subside. The brine is then put into the nads, where it remains a day, deposits 5 or 6 sers of the finest and largest crystals of nitre. Some water is then added to the clay that has subsided, and having washed out the saline particles, is called moran-ras. This is added to the ley (ras), which is again treated with 30 mans of crude nitre, and this is repeated until the whole crude nitre is boiled. The nitre of the subsequent boilings is smaller than that of the first, but all are mixed together. A hundred mans of crude nitre give 60 mans of refined. The whole is done by hired servants at the Company's expense. The old clay from about the nads, after being kept a year, gives nitre by the usual processes. The rainy season is the most favourable for refining nitre. The process for making the crude nitre is nearly the same here as in the districts hitherto surveyed. I shall here therefore mention chiefly the various terms in use for the different steps.

Ashes are not necessary to complete the formation of the nitre, and are only added when the soil is rather stiff. About 20 baskets, each containing 25 or 30 sers (50-60 lbs.) of the saline earth, give 60 sers of brine (ras). This boiled and cooled gives a nitre called Gad or Dhoya. The ley remaining after the crystallization is called Kahi, and when boiled and cooled gives a nitre called Rasi. The ley then remaining is called Jarathi; and when boiled and cooled gives a nitre of the same name. The remaining liquor, called Pachhari, is boiled for a culinary salt, called Khara, or Pakuya-nimak; but, when the ley is poured into the cooler to allow the nitre to crystallize, a quantity of the same culinary salt is always found in the bottom of each pot in which the evaporation has been conducted. The quantity of this salt usually equals that of the nitre, and another boiling would render it much superior to the salt made at Calcutta. The workmen allege that during the season, which lasts six months, each Bhatthi or

fire makes only 7 mans of this crude nitre, for each of which they get about 1 r., and the man consists of $42\frac{1}{2}$ sers of 80 sicca weight, or $87\frac{1}{4}$ lbs. This statement, I am assured, is quite wrong, as the Zemindars have hitherto contrived to exact illegally at least 6 or 7 rs. a year from each furnace. A very intelligent agent of the commercial resident assures me, that the quantity of crude nitre made in these districts is not less than 8,000 mans, or 14 mans for each furnace, which, after paying the rent, will leave only about 7 rs. profit to the manufacture, who could not live by such a pittance, did not he make a good deal of the salt that will be next mentioned, and did not he make the Pakuya salt from the nitrous earth. I suppose his real earnings may be 14 mans of nitre = 14 rs.; 14 mans of Pakuya salt = $17\frac{1}{2}$ rs.; 2 mans of Dhar = 4 rs. :— Total, $35\frac{1}{2}$ rs. Deduct 7 rs. for rent, and the profit will be $28\frac{1}{2}$ rs. About one man, one woman, and two boys or girls, are usually employed at each furnace for six months. The 566 furnaces will therefore give about 8,000 mans of crude nitre in the season. Were it made worth the while of the manufacture (shorahpuz) the quantity might no doubt be greatly increased; although the workmen allege that the people here, on account of jealousy, will not allow them to scrape their walls, and on these the best nitre is formed.

I am informed that the makers of nitre prepare a salt called Dhar-Nimak; and I am inclined to think that the quantity is considerable, and that much pains are bestowed in concealing the manufacture, because, though I inquired at every Thanah after saline earths, I no where heard of this kind, until the people employed in the Company's factories gave me the information. This salt is said to be found efflorescing on the surface of many parts at a distance from villages, and is called by the same name (Reher) with the soda, which effloresces in a similar manner, and it was probably owing to this identity of names that it escaped my notice. It is no doubt the same with the Beldar salt of Furaniya; and, according to the information I have received, is prepared in the

same manner as I have described in the account of that district. It forms a granular culinary salt, and although rather bitter, sells at 2 rs. a man, or double what is allowed for nitre. Of course the makers of nitre prefer as much as possible the manufacture of the Dhar, and prepare the nitre merely as a cloak for the illicit employment. It is usually supposed that the culinary salt from Calcutta is adulterated at Patna with a salt called Khari, which is a purgative salt made in Tirahut, and used for giving to cattle, and in the manufactures of leather and red lead. I cannot take upon myself positively to contradict this supposition, because an investigation, such as I have above recommended, would be necessary to come at the truth. I am inclined, however, to think that this common opinion is a mistake, and that the salt used to adulterate what is imported from Calcutta is this Dhar, or another called Khar, which comes from Tirahut, and which, I am informed, is different from the Khari. I conclude, indeed, that this Khar is in fact the same with the Dhar of Behar, or the Beldari salt of Puraniya, because it sells at the same price, is said to be found in similar situations, and to be prepared in nearly the same manner; but it is said to come to market in solid cakes, which may be owing merely to the ley having been evaporated to dryness. Besides no Dhar is made in Tirahut, nor is any Khar made in Behar, which considering the vicinity of the districts, is a presumption that the same substance is called by different names. I am told that from 15,000 to 20,000 mans of these salts are annually brought to Patna.

As the subject of these saline matters is very curious and important, I hope I shall be excused for mentioning what I once had an opportunity of observing in the Tirahut district. The salt called Khari, which has been mentioned above, is made there at no great distance from the Ganges about 4 coses east from Singgiya, a factory of the Company. The saline earth, from whence this also is made, is called Rehir, and effloresces on the surface of several places of Pergunahs Besara,

Gadasangr, Bhatsala, Jaruya, Partaul, Lai, Rati, Chhapra, Maker, Goya, Sangrampur, Marahal, Barui, Dangsi, and Barel, in the districts of Saran and Tirahut. It is scraped as usual and collected at the furnace. A little rice straw is first placed on the ground, and covered with the saline earth to about four inches in thickness. The straw is then burned, and the burnt matter is covered with a foot of straw, and that by four inches of saline earth, when this straw also is burnt, and the same is repeated seven times; after which the heap is covered with some fire-wood, which is burned. The burned saline matter (bani) is then put into a cistern of clay, and about 3,000 sers, or 6,000 lbs. of water are poured upon it. Next day the workmen take out the uppermost part of the matter, which had been put into the cistern, and from whence this water has washed the saline parts, and add as much more water, and this is repeated again and again, until all the salt has been extracted, and nothing remains in the cistern but brine. This is then allowed to flow from a cock, and is evaporated in from 30 to 40 earthen pots, placed in a row over a trench, which serves as a furnace, the fuel being put in at one end, and the smoke coming out at the other. The evaporation is carried to dryness; but the Khari turns out of three different qualities, which is attributed to circumstances in the burning that are beyond the control of the artists. When the operation has succeeded well, they procure a whitish salt in grains, which is called Phulkhari, and is that given to cattle. It sells at 88 sers (72 s. w.) or $178\frac{1}{4}$ lbs. for the rupee. When the operation has less success a more impure salt called Sindur-Khari is procured, and is used in the preparation of red lead. It is sold at 96 sers for the rupee. When the operation is least successful, a very black salt is procured in a solid mass. It is called Chamari-khari, being used by tanners, and sells at 112 sers for the rupee. All these I have refined into a very fine purging salt, which in its crystals entirely resembles Glauber's salt, but its taste is not near so strong or disagreeable, and I would recommend that the commercial resident

should be directed to prepare a quantity sufficient for the hospitals. It would come much cheaper than the purging salts imported from Europe, and is not inferior in quality to the best of them. Should he be doubtful of skill to conduct the process, he might send a quantity of the crude salt to the Company's apothecary at Calcutta by whom the operation would be no doubt more properly conducted.

I have already mentioned the soda found in these districts and called also Reher. At Dhongra and Kurtha in the division of Jahanabad some of this manufacture has been abandoned. Whenever the soda is found, it is used by the washermen; but it is only the glass makers of Sheykh-purah that give it any preparation and make a soda called Papri. Their process I have described when treating of the manufacture of glass.

DIVISION II. OF COMMERCE.

Section I. Of Exports and Imports.

The amount of the exports and imports as taken from the traders, is given in the Appendix but I must add that I consider this table as of no authority with regard to the amount of each article, the traders here being still more shy than those of Bhagalpur. I have however no means of forming a rational conjecture concerning the amount of many of the articles and therefore give the whole as I received it, but I shall notice the amount of such particular articles as I have had an opportunity of ascertaining with more or less accuracy. These districts are most productive of rice, and that of Patna is celebrated throughout Bengal for its fineness, and I have no doubt that in general the exports far exceed the imports; but for two or three years before I travelled through Behar, the crops of this grain had been very scanty and no doubt the imports of coarse rice had been great. It has been brought from Puraniya, Tirahut and Sarun, and the exports of the fine rice are made to Banaras, Murshedabad and Calcutta, but some coarse has been sent to Shahabad, where the crops have been still worse than in Behar. A little of the fine kinds are sent to the districts from whence the coarse is imported.

The Kodo Maruya and Kauni are imported from Tirahut and Sarun.

The wheat and barley come mostly from the same places, but some also from Bhagalpur. The wheat is exported to Calcutta, Murshedabad and Banaras, the barley to the latter.

The Maize and Janera come from Tirahut and Sarun, and are sent mostly towards Banaras.

The Bajra comes from Shahabad and is sent towards the east.

The China or Millet and Sama come from the same places with the Maize.

The Jaokeras comes from the same places and from Bhagalpur, and is sent towards the west.

The But comes from Tirahut, Saran and Shahabad, and is sent both east and west. The export of this article is probably very much underrated.

The Bhetmash comes from the north side of the Ganges.

Much of the pulse, called Arahar in most places of Bengal, is supposed to come from Behar, but this would seem to be a mistake. The quantity that I saw was not great, nor to be compared with what grows in Bhagalpur and the northern parts of Puraniya. What is imported here comes from Tirahut, where I know there are great quantities. The exports are made to Calcutta and Murshedabad.

The pease are said to come mostly from Bhagalpur, and are sent all to Murshedabad and Calcutta. This seems a strange perversion of labour and it not confirmed by the accounts received in Bhagalpur. I presume therefore, that these imports do not take place, and the quantity of pease produced in these districts is very great.

The Bhringgi comes from Tirahut and Saran.

The Bora comes from the same places, and is sent to the east.

The Mung comes from Tirahut and Shahabad and is sent to the east.

The Urid comes from the north side of the Ganges.

The Khesari is said to come from Suryagarha and to be sent to Calcutta and Murshedabad. I saw little or no grain of this kind near Suryagarha, and no country abounds more with it than Behar. The whole exported, I have no doubt, is the produce of these districts.

The Masur or lentils are said to come from Suryagarha and Tirahut, but what I have said respecting the Khesari of Suryagarha is quite applicable to the lentils. They are sent to the east.

The Kulthi comes from the north side of the Ganges and is sent to the east.

The rape mustard and Sesamum seed come from the same quarter, and are also sent to the east.

The poppy seed comes from the same place and from Shahabad, and is sent to the east.

The linseed and mixture of linseed and mustard come mostly from the north of the Ganges, especially from Sarun, and the former is sent to the east.

The seed of the *Ricinus* comes from the same place and is sent down the Ganges.

The oil mentioned, partly that of mustard and partly that of linseed, comes from the same places, and is sent in the same direction.

In most parts of Bengal, in order to conceal the profit from cattle, it is stated that all the Ghiu is imported from Patna, but in fact this is not a milk country, and the imports from the northern banks of the Ganges are great, while some comes from Ramgar. That exported is sent to Calcutta and Murshedabad, but the quantities that are sent there and to Dhaka from Puraniya, Ronggopur and Bhagalpur must be much greater than I have stated in the accounts of these districts.

The milk is imported from the northern banks of the Ganges for the supply of Patna.

The Salambi-nemak is a culinary salt from the west of India, which began to be imported in 1810 and 1811, and therefore enters into the tables formed especially from the state of commerce in the latter year; but in this year, 1812, the commerce has, with great propriety, been checked, as interfering with the valuable revenue levied on the salts that are made and imported in Bengal, and the produce of the Company's provinces.

The latter, called Karkach or Saphri, and the former called Pangga, come from Calcutta, and are sent to the west, to Tirahut and Sarun and to Ramgar.

The sugar and extract of sugarcane come from Gazipur, Shahabad and the north side of the Ganges, and are sent down the Ganges.

The Molasses, Shukkur and coarse sugar, called Bhura, come from Gazipur, and are sent towards the east.

The Honey comes from Nepal and the Sundarbans of Yasor, and is sent both east and west.

The betle nut is all of the kind called dry, and the produce of Bengal. It comes from Dhaka and is sent west, north and south.

The coconuts come from Dhaka and Calcutta and are sent in the same directions. Some are entire; some have had the shell separated, and some are the produce of the Maldwipi islands.

The tobacco comes from Tirahut.

The Ganja or hemp buds come from Yasor (Jessore, R.), and are sent to the north and south.

The amount of Indigo I have taken from the calculation of the produce given by the farmers, and value at 140 R. a man as the native merchants do not trade in this article, and gave no estimate of its amount.

The total amount of opium, so far as relates to the fair trade, is quite exact, being furnished by Mr. Wilton, the agent, and includes every expense incurred in purchasing and transmitting to Calcutta the opium sent by him to the Company's sales in the year 1811/12. I should perhaps have valued the imports from Tirahut, Saran and Shahabad at a lower rate than what grows in these districts, because the expense of the chief factory at Patna and of boats, package, &c. comes chiefly to these districts; but the difference would not be great and the investigation would be difficult, as Tirahut especially furnishes a part of almost everything that is used in Patna. The illicit trade in this district, I believe, is very trifling, but I cannot venture to guess at its amount.

The Mahuya flowers come chiefly from Ramgar, but a little is from the northern bank of the river, and some from Shahabad; they are sent towards the east.

The Turmeric and Ginger come from the north and are sent to the east and west, mostly to the latter.

Although this country produces the best betle leaf known on the banks of the Ganges, the great supply for the lower classes in Patna comes from Tirahut, the Maghaiya kind being too dear. A little of this latter is exported for the luxurious in Lakhnau, Calcutta and Murshedabad.

The Safflower comes from the northern side of the Ganges and is sent to the east.

The Jira seed is sent to the east.

The Pasari goods or drugs consist of a vast variety of articles, and in the nomenclature of the native merchants include sugar, ghiu, honey, betlenut, dry ginger, safflower, Jira seed, catechu, lac and its lake, Bhinda iron, steel, copper, tin and its leaf, zinc, lead, dhuna, red-lead, nitre, dried fruits, musk, and red starch, which are mentioned as separate articles, as many others besides the druggists deal in these articles. The articles in which they exclusively deal are spices, black pepper, sandal, medicines, dyes, paints, mica, glue, &c.

The Wax comes from Ramgar and Nepal, chiefly from the latter. The wax is made into candles and sent through all the Company's provinces for the use of Europeans. The exports are stated at less than $\frac{3}{4}$ of the value of the raw material; but this is owing to a small quantity alone being exported by native merchants. Almost every European that passes supplies himself with a quantity for his own use, and numerous commissions are sent to those who reside at Patna, by their friends at a distance. The natives are very few. The exports on the whole cannot be less than 60,000 rupees.

The Catechu or Khayer comes from Tirahut and Ramgar, rather most from the former, and is sent to Calcutta, Dhaka and Murshedabad.

The glass rings come from the west.

The imports of lac are probably somewhat underrated. The shell-lac used in making ornaments cannot be less in value than 15,000 rupees and the quantity produced in the country is inconsiderable. Some shell-lac comes from Lakhnau, but the great importation is of stick-lac from Ramgar.

The Golal or lake prepared from lac is sent to Calcutta, Murshedabad, Patna and Tirahut.

The gold comes from Nepal and is supposed to be wrought up into ornaments at Patna. Great quantities of butter are also imported by the pilgrims but cannot be considered as an object of commerce.

The copper, zinc, tin and lead come from Calcutta and are sent to the north and west.

Almost the whole iron comes from Ramgar and is sent to the north; a very little of this kind is sent to Dhaka and Puraniya. A very little European iron comes from Calcutta and is sent to the west.

A kind of iron used in making fireworks is imported from Murshedabad and is sent to the west.

The brass and bell metal vessels come from Kangtoya and Murshedabad and are sent to the north and west.

The iron ware consists of pots and other vessels for boiling, comes from Merzapur and is sent to the north.

In the Patu or hemp and sackcloth of the Corchorus is not included that imported by the Company from Puraniya; but that makes little difference, as the whole is again exported in packages. What is used by the natives and entered in the tables comes from Tirahut and Puraniya, but is probably all the produce of the latter, or of Ronggopur, and that exported is merely in packages.

The Kasmiri-San, or hemp of the *Crotolaria juncea* comes from the north and is sent to the west.

On the subject of the cotton wool I have already had abundant occasion to dwell and to show that according to the report of the custom house officers the quantity imported into the town of Patna is about 35,000 mans, valued in their accounts at 350,000 R., but that is the invoice price at Merzapur, from whence it comes. Rupees 14½ a man is about the usual wholesale price at Patna. The value therefore should be stated at 5,07,500 in place of 1,30,000. The 3000 R. said to be imported in other places would at the same rate amount to 11,700 R., but the import of this raw material, as I have said in my account of the manufacture, must be more considerable than even this augmented statement. The excess of thread imported from the north side of the Ganges, above what is export-

ed to Bhagalpur and Puraniya, will be by no means sufficient to make up the quantity required by the weavers, especially as some of the cotton reared in the country is said to be sent to Shahabad.

The exports of cotton cloth are very important. No less than 22 native merchants have factories for the purchase of plain cotton cloths, and the Company may take about 2,00,000 rupees worth, besides what comes from Tirahut, &c., which is not mentioned in the tables, and many merchants from a distance come for a short time, make purchases, and then carry it away to their place of usual residence. In all, the exports of this cloth cannot be less than the 5,45,000 rupees which the merchants state, and is probably more. The whole almost is sent to Calcutta. The Company's is sent to Europe. Some of that purchased by individuals is for the markets in the gulph of Persia, and some is purchased by the Americans and Portuguese. The cotton cloth imported is chiefly coarse from Ramgar, Shahabad, Saran and Tirahut, but there is some fine from Dhaka and Kaligang in Puraniya.

The Diaper is chiefly bought by European passengers. Some is sent to Murshedabad.

The Tasarguti or cocoons of the Tasar silk are vastly underrated, the quantity required for the manufacture at the retail price being worth 1,89,000 rupees, and that produced in the country being trifling, as I have said in the account of the natural productions. This material comes from Ramgar and Virbhum.

The cloth made of Tasar silk is imported from Vishnupur in Virbhum, and the 24,000 rupees worth said to be exported are sent to Shahabad, Saran and Tirahut; but at least 50,000 R. worth are sold at Gaya to the pilgrims from the west, and a great proportion of the Phatuha goods is purchased by the troops passing, as the women of the tribes from which our seapoys enlist are fond of this dress.

The cloth of pure silk comes from Kasembazar and Sibgunj in Puraniya, and is sent to the north.

The raw silk comes from Ronggopur and Kasembazar.

The cloths of cotton and silk mixed come mostly from Maldeh and English bazar, but a few from Banaras. The exports are to Lakhnau, Tirahut, Saran, Shahabad and Ramgar, besides what is sold to the Marhatta pilgrims.

The cotton and woollen Sutrunjis or carpets come from Merzapur and are sent everywhere to the east. I believe that the exports are much greater than here stated, perhaps double.

The chintz comes from Lakhnau and Merzapur and is sent chiefly to Calcutta.

The Kharoya cloth comes from Merzapur.

The blankets come from Shahabad and are sent to every part of Bengal. On this subject I have already had sufficient occasion to dwell.

The gold and silver thread and lace is sent to Calcutta, Murshedabad and Dhaka, and comes from Banaras, that imported from thence being of a better quality than what is made here.

The shals come from Lakhnau and are sent to the east.

The perfumes and essences come from Gazipur and go to the east. There is great reason to think that the exports are more than stated, as the workmen are in very easy circumstances.

The leather bags and targets are sent east and west: the quantity very much underrated, the great export being from Daudnagar where none was brought to account.

The shoes imported are from Lakhnau; those exported are sent all over Bengal.

The Manihari goods consist chiefly of glass beads, Rudraksha or beads of the *Eloeocarpus*, looking glasses, the glass ornaments pasted on women's foreheads, wooden cups and turned boxes, hair combs, brass cups, cutlery, crystal, true and false jewels, and tape. These wares come chiefly from Calcutta and are sent west, north and south.

A little of the paper come from Nepal; the remainder comes mostly from Shahabad. It is exported to the east. The quantities both exported and imported are probably much underrated,

the whole manufacture at Arwal on both sides of the Son being worth on the spot 28,000 R. When this is smoothed and fitted for the market, it will be at least worth 32,000 R. and probably 24,000 will be exported, $\frac{2}{7}$ belonging to these districts and $\frac{5}{7}$ to Shahabad.

The wooden furniture consists of platters imported from Saran, and of coarse bedsteads, mortars, pestles, ploughs, &ca., imported from Ramgar and Shahabad, and of tables, chairs, couches, boxes, bedsteads, &ca., sold to Europeans, chiefly passengers.

The timber comes from Gorakpur and consists of the *Shorea robusta* (Sakhuya) and Sisau (*Dalbergia*).

The small posts, beams and planks and bamboos come mostly from Rautas in Shahabad, with a few from Ramgar.

The firewood and charcoal come from the north; a little sometimes from Mungger.

The baskets come from Ramgar.

The mats come from the north and east.

The ratans come from Dhaka.

The reeds (Nal) for making tobacco pipes come from Dhaka.

The reeds and grass used for thatch come chiefly from the north side of the Ganges, and a little from Shahabad.

Sabe and Muj grasses, for making ropes, come from both north and south.

The leaves used for plates come from the south.

The Dhunea or resin of the *Shorea robusta* comes in about equal quantities from south and north and is sent both east and west. It is the most common incense.

The venison and game comes from the north side of the Ganges.

The fish and swine do the same.

The sheep and goats come from Ramgar, Shahabad and the north side of the Ganges. A few are sent towards Calcutta.

The buffaloes and oxen come from the north side of the Ganges. The imports of the oxen are probably much greater than stated in the tables.

The leather of oxen and buffaloes comes from Shahabad, Saran and Tirahut.

It must be observed that salted meat to a considerable extent is sent from Danapur to Calcutta and the east by Mr. Howel, but the amount I do not know.

The lime comes from Rautas.

The stone wares imported consist of mill-stones and stones for grinding curry stuff from Chandalgur (Chunar, R.), Sahasram, Merzapur and Mungger. These exported are plates and cups made of the Sung-musa at Gaya.

The Soda is almost entirely in the form of cakes called Saji; the quantity of Reher is very trifling. The imports are from Gazipur and the exports towards the east.

The purgative salt called Khari comes from Saran and Tirahut and is sent to the east.

Soap, which has been entirely omitted in the tables, must be exported to a considerable extent.

The singing birds come from the north.

The red lead comes from the east, the fine from Calcutta and the coarse mostly from Puraniya and Murshedabad, but a little from Tirahut and is sent to the north and west.

The vegetables for eating consist of potatoes sent to Banaras and Bengal, and of various sorts imported to Patna from the country beyond the Ganges.

The saltpetre is exported to Calcutta, now entirely on the Company's account, but for the two last years a good deal was sent by private merchants.

The fresh fruit consists of melons, water melons, jacks, tamarinds and mangoes imported at Patna from the north side of the Ganges, and of pomegranates sent to Murshedabad and Calcutta. A few fine pomegranates come from the west.

The hot seasoning, onions, garlic and capsicum, is imported from the northern bank of the Ganges and is sent to Calcutta and Murshedabad.

The dried fruits are mangoes from the north; raisins, almonds, dates and Chhohara, which come from Calcutta; and of Kismis and Monukka, a

Patna, where some have to the extent of 500 rs. The Gandhi deal in rose water, perfumed oils and essences, tooth powder, and the finer kinds of implements used for smoking. They have capitals of from 100 to 1,000 rs. The perfumes are also retailed by those who make them. Some Pasis, or druggists, as I have mentioned, are merchants, who deal by wholesale; but the common druggists are shopkeepers, although several that retail have some capital, and import their own goods; but these do not sell trifles, under the value of a rupee. Many retail in the streets, and some sell salt.

Paper in most small towns is sold by the Pasis, or druggists, or by the Khichri-furosh, who deal in Pasi goods; but in Patna some shopkeepers (Kaguzi) sell nothing else, except blank books for keeping accounts. Some of them purchase the paper rough, and have it smoothed by the Mohurahdar. Their capitals are from 40 to 150 rs. Some persons of the Kayastha tribe hawk about the streets the books in the profane language that are most commonly read. Two Brahmans in Patna hawk almanacks made at Benares.

Some druggists sell soap, and some of those who deal in tobacco do the same; but it is most commonly sold by Paikars, who advance money to the makers, and retail it in any quantity that is wanted. None of their capitals exceed 100 rs. The impure soda called Sajimatti is sold by some druggists; but some Paikars retail nothing else, and purchase it from the west-country merchants, by whom it is imported. They sell the smallest quantities, and have capitals of from 100 to 200 rs. Cotton, both in the seed and the wool alone, is retailed partly by those who clean it (Dhuniyas), partly by the Khichri-furosh, and partly by traders who deal in nothing else, and who, according to the extent of their dealings, are called Paikars or Phariyas. Few of the latter have shops, but go about from market to market. The Paikars bring a considerable quantity at a time from Patna, and retail part themselves, and sell part to the Phariyas.

The persons who retail cloth (Buzaz) are not distinguished by name from the merchants who deal by wholesale, and many of them in fact import pretty considerable quantities, and a few export as well as retail. In general, they have shops, and have from 20 to 5,000 rs. capital, and one in Patna has 10,000 rs., and two have 50,000 rs. each. A few hawk about the streets. They deal in woollen, silk and cotton; and, in Gaya, a few retail brass and bell-metal vessels. Some dealers in money (Surraf) deal also in cloths.

Some merchants (Mahajans) from Kasmir retail shawls, the woollen cloth called Lui, and furs, all of which come from their original country. In return they export fine cotton cloths, and must have pretty considerable capitals, that is, perhaps 5,000 rs. each. Chirawalehs are those who hawk turbans in the streets. They purchase from the weavers, and have capitals of from 10 to 30 rs. Some Dom and Pawangriyas sell old clothes. The former collect them from dead bodies, the latter by begging. Such as are fit for wearing are bleached, and sold to the poor. Such as are mere rags are sold to the torch-makers. Some Paikars retail small carpets (Sutrunji) and brass implements for smoking tobacco (Gurguri). They have capitals of from 200 to 500 rs. Some of those who sell shoes retail also the two above-mentioned articles. Persons called Panchuniyas retail flattened wire (Badla), leaf, thread, lace, and cloth of gold or silver, pearls, and coral. They have capitals of from 100 to 2,000 rs. The Churminah Furosh retail shoes. Many have shops, but a few sell in the street. Some in Patna, besides shoes, sell small carpets, and the tubes used in smoking tobacco. Many of those who keep inns sell shoes. Some of the retailers of shoes in Patna have considerable capitals. Two have 50,000 or 60,000 rs. each, and supply merchants with large quantities; 40 have from 100 to 1,500 rs.; the others there, and those in country towns, have from 5 to 100 rs.

Some Dholak-walehs sell in the streets drums, which they have made partly by carpenters and partly by tanners. They have capitals of 4 or 5 rs.,

which they advance to the artificers. The Selahbunds hawk targets and swords in the streets. Some persons called Lohar-Dokandars, or Furosh, and Chatiya-Furosh, retail iron, sack-cloth, and the hems of the Crotolaria and Corchorus; but in many country towns iron is retailed by the druggists, and those who deal in iron and sack-cloth are sometimes distinct. The Chatiya-Furosh have usually capitals of from 50 to 200 rs.; but two men in Patna, who deal in iron alone, have each 1,000 rs., and purchase it in considerable quantities from the traders that bring it from Ramgar. The Lohasaz sell by retail several kinds of ware made of iron, chiefly nails, hinges, locks, pots, and chains. They have capitals of from 200 to 500 rs., and are confined to Patna. These articles in other parts are sold by the makers. In the country most of the brass and bell-metal vessels are retailed by those who make or repair them; but in Patna chiefly there are some Paikars who advance money to the coppersmiths, and keep shops in which they retail these goods, and they purchase also such as are imported from Kangtoya. Two of them are rich, having 5,000 or 6,000 rs.; the others may have from 100 to 500. One dealer in Gaya has a capital of 1,000 rs. A few cloth-shops in Gaya retail brass vessels. Two men, called Mahajau, having capitals of about 1,000 rs. each, sell brass and copper vessels, which are polished, and intended for the use of Muhammedans. Some Sindur-walehs, or Paikars, entirely live by retailing red lead, which they import. They have capitals of from 50 to 200 rs., and have shops. Some people, called Ranggasaz live entirely by selling ornaments of tin. They have shops, but sometimes they cry their wares in the street. Their capitals may be from 5 to 20 rs. Some Churisaz live entirely by selling the ornaments made of glass, purchasing from the makers, and keeping shops. They have capitals of from 10 to 50 rs., and are usually called Chur-Furosh. A man, called a Motfurkat, lives by selling old European mirrors that have been purchased at public sales, and repaired glass lanterns, wine

bottles, and broken crystal glasses. His stock may be worth 200 rs.

The term Soudagur, which implies merely a principal merchant, is here usually given to those who keep what the English of India call Europe shops; that is, shops where all sorts of goods imported from Europe, and chiefly consumed by Europeans, are retailed. One shopkeeper of this kind at Danapur has some claim to so high a title, as his dealings are pretty considerable. He is an European. The others are natives, and their capitals are very trifling. They deal chiefly in old glass ware, the refuse of the Calcutta shops, and in the most execrable liquors; both of which, I presume, are chiefly purchased by natives. The only other persons here usually called Soudagurs are such as deal in horses. They purchase, chiefly at the Hajipur fair, horses that are reared on the north side of the Ganges, and sell in these districts. Each may annually buy and sell 10 or 12 horses, and are fully as slippery as the dealers of England.

Some Mirshekars deal in singing-birds, or such as are kept as pets. These catch the birds and hawk them about the street. Some Muhammedan hucksters sell fowls, pigeons, and eggs in the streets, purchasing them in the villages. The Mahi-furosh retail fish, chiefly in the street. A few are of the Kungjra caste, but many belong to tribes, the men of which fish; for those who retail are mostly women. They have capitals of from 4 anas to 125 rs.

The Subzi-furosh Kemānis, or Kungjras, retail vegetables and fruit. A little is sold by the gardeners, but this is not common, and some of the Kungjras sell fish, but here that custom is much more rare than in Bengal. A very few only have shops: in general they retail sitting in the streets, and have capitals from 100 to 200 rs. The men chiefly purchase, and the women retail. Some people deal in Bhusa, the dry forage usually given to cattle, and retail it in barns, purchasing the loads brought in by farmers and traders. They have capitals of from 10 to 50 rs. Some Parchuniyas deal in grain, others in gold and

silver lace, cloth, &c.; and there is a third kind who deal in bamboos, planks, and small posts and beams. The persons, however, who deal in these articles are more usually called Taluya, and in Behar they are called Gangjihara. They purchase from the traders, who bring these commodities from the hills, and sell by retail; and their capitals do not exceed 1,000 rs. It is supposed that on each sale they clear 25 per cent.; and this, indeed, is supposed to be the common rate of profit, which retailers make.

The Kolhuyas deal in Sal and Sisau timber, which they chiefly purchase from the merchants, who bring these articles from Gorakpur; but some of them import on their own account. They often hire people to saw the timbers and retail the planks. They have capitals of from 300 to 2,000 rs. The Kathauti-furosh retail large wooden platters (khanchah), basons (kathauli), mortars (ukhli), pestles (musur), and rolling pins (belna). All these come from Saran, and are partly turned, partly cut with a small adze. They purchase from the importers, and have from 50 to 100 rs. capital. The Kangchiya-furosh retail mats made of bamboos, baskets, ropes made of the grass called sabe, ropes made of the muj reed, rude bedsteads, wooden mortars and pestles, all imported from the forests of the south. They have capitals of from 25 to 200 rs. The Chatai-furosh retail mats made of reeds (nal) and grass (kus), which are used chiefly as a covering for commodities in boats. They have capitals of from 50 to 200 rs. Mats are in general sold by the makers, but in Patna a Madurwaleh sells the kinds called here Madur, which come from Bengal, but are all small. He has little capital, procuring a supply from the boatmen that come from that quarter.

Pangkhawalehs retail in the streets rude fans, which the Pasis make of palmira leaves. Some people in Patna live by purchasing and retailing the platters made of the leaves of the Paras tree (*Butea-frondosa*), and a kind of oakum (raswat), used for caulking boats, and prepared from the bark of that elegant tree. They have capitals of

from 20 to 40 rs. These have shops; but a few sit in the streets, and are not worth above 4 or 5 rs. Some Vairagis hawk wooden beads, used both as ornaments and as rosaries, and are called Mala-walehs. Some people, called Nariyali Paikars, deal chiefly in cocoanuts, which they retail. They also employ the oilmen to extract the oil, and retail both this and the shells. They have capitals of from 50 to 200 rs. The Nariyali-furosh, again, sell only the implements used for smoking, made either of the cocoanut or of potters' ware. They have capitals of from 20 to 50 rs. The Dibiyafurosh retail small wooden boxes, covered and painted, that are made by the turners. These artists, however, retail a good many. The mere retailers have capitals of from 40 to 200 rs. The same boxes are also retailed by the Manihari. In the streets of Patna some hucksters (Kangghai-walehs) sell wooden combs for the hair; but many such are sold by the makers, and still more by the Maniharis. The Maniharis, who retail the goods so called, are numerous, and are mostly of the Daphali tribe. Two or three are wholesale dealers, and have been already mentioned; but only a few have shops, and the greater part retails in the street. The goods in which they deal have been mentioned in the accounts of districts already surveyed. Some here deal in false gold and silver wire and lace. Their capitals are from 5 to 200 rs. The Besatis are hucksters, who retail in the streets some kinds of Manihari goods, such as brass and iron hardware, looking-glasses, hair-combs, surma, or drugs for staining the eye-lids, and curry-combs, and also purses, cotton, silk, and woollen strings, tape, and wooden cups and boxes. Their capitals are from 5 to 50 rs.

Stone plates and cups, millstones, and stones for grinding curry, in Patna and Gaya, are mostly sold by the makers; but there are persons who merely buy and sell by retail, and have capitals of from 50 to 100 rs. They are called Sungturash Dokandars. The potters dispose of most of their own ware, but there are some persons who live by retailing pots, and are called Hangri-furosh and

Bharchariyas. Their capitals are from 5 to 10 rs. Some people (Sorahiwalehs) sell earthen bottles and pots for cooling water, and earthen vessels painted with porcelain clay, but the same things are often retailed by the makers.

The artificers, who retail in shops or in the streets, are as follows:—

Tallowchandlers, 23; laheri, 33; soap-makers, 21; torch-makers, 24; churihara, 34; wax-chandlers, 22; malis, 38; ink-makers, 39; glass-blowers, 37; basket-makers, 42, 43; petara-makers, 44; umbrella-makers, 40; paper kite-makers, 48; cleavers of firewood, 94; morhasaz, 45; chamar, 54; khugirdoz, 59; chik, 51; naychahbund, 61; nariyali hokka-makers, 62; whip-makers, 60; tobacconists, 64; majunwalehs, 66; Diyawal, 63; pasis, 68; perfumers, 70; distillers, 67; Dahiyars, 73; butter-makers, 74; oil-men, 72; halwais, 76; khanchahwaleh, 77; mayras, 75; khasiyawaleh, 79; Kungjtilayi, 80; bharbhuna, 78; dalhara, 82; bakers, 83; millers, 81; small meat-butchers, 85; black cattle-butchers, 86; faludahwaleh, 84; wooden comb-makers, 89; kharadi, 90; khandigars, 88; blacksmiths, 97; birdcage-makers, 98; carpenters, 95; needle-makers, 103; copper-smiths, 104; arrow-makers, 102; rangdhaluya, 110; jewellers, 113; brass ornament-makers, 105; potters, 124; lime-makers, 129; stone-cutters, 123; brick-makers, 127; chints-printers, 144; cotton-beaters, 130; weavers, 137; carpet-makers, 147; tape-makers, 153; glove-makers, 146; kangjar, 155; tashbaf, 149; patwar, 153.

In most of these trades it is a few alone that retail; but in others almost every one disposes in this manner of his goods. In these districts, as well as in Puraniya, some Paikars are like the Amdehwalehs of Bengal, that is, they purchase cargoes as imported, and dispose of them in smaller lots; others are mere shopkeepers; and finally others are petty traders, who do not retail, but purchase small investments from the merchant, and dispose of them to shopkeepers in various towns, and again collect from the farmers and manufacturers small cargoes, which they deliver

to the merchant. These last-mentioned Paikars are not very numerous; because they decline in general to keep oxen, and therefore they live chiefly in towns, and purchase up the articles which are brought for sale by the Baldiya Beparis. These Beparis carry on by far the greater part of the internal commerce of these districts. They are often called Ladu Baldiya, or Telibeparis, from the nature of their profession, or from their caste. Besides their oxen many have very little capital, 5 rs. in money being reckoned sufficient to enable a man to trade with one ox. With such a stock it is supposed that he can gain 32 rs. a year, selling 50 rs. worth a month, with a profit of from 1 to 2 anas on the rupee; but if he has more than three or four oxen, he must hire servants in proportion. For security several usually travel in company, unless when one man and his servants are sufficiently strong. From 5 to 50 rs. and from 1 to 10 oxen are the usual rate of stock which these men possess, those who have one or two oxen only assisting their more wealthy companions, and receiving a reward for their trouble. Some, however, especially in Sheykhpurah, Nawada, and Daudnagar, deal to the extent of 500 or 600 rs. with cattle in proportion; and it is supposed that in the two former divisions some of these have accumulated large sums (from 1,000 to 20,000 rs.), although from their appearance one would not suppose them to be worth a crown. They are all willing to hire their cattle, and only trade when they cannot procure farc. Some of them are called Kuttiwalehs, because they purchase rice in the husk, employ people to beat it, and then sell the clean grain. They are also called Chutkiyas, or handfulmen, because they carry in their hand a muster of the commodity which they have for sale.

The Grihastha-beparis, or farmers who trade, are in some places called Barsariyas, are not very numerous, and seldom keep cattle for carrying loads; they purchase the commodities from their neighbours, and either sell them to the Baldiya-beparis, or hire these to carry them to market. Besides their stock employed in agriculture, they

have from 100 to 1200 rs. engaged in commerce, and cannot in the year turn their capital more than twice, whereas the ladu-beparis turn their capital from 3 to 10 times a month during the 8 months that the roads admit of their cattle to travel. The Grihasta-beparis purchase the produce of the farms at harvest, or even before it is ripe, and sell five or six months afterwards when the price has risen. It is usually supposed that they make 20 per cent. on each crop; but their gains are probably greater. as the farmers who deal with them are considered as more necessitous than those who borrow money at the rate of 25 per cent. for 16 months. The Pheri-walehs or pedlars deal chiefly in cloth, the police having prevented their dealing in copper vessels, as it was supposed that they dealt chiefly in stolen goods. Those who have their family residence in the town of Behar, on account of their caste, are called Bhojpuriya Nuniyars, and have capitals of from 50 to 500 rs.; but many frequent these districts whose family residences are unknown.

There are a good many Delals or brokers, who have no capital engaged in trade, and live by making bargains for others. In Patna they have the shopkeepers under a good deal of subjection, and scarcely any purchase, even to the value of one rupee, can be made without their interference, and of course they enhance the price by the amount of their commission. It is of no use ordering them to go away, because they stand at the door and receive the commission when you go; nor can the least dependence be placed on their assistance in preventing the purchaser from being defrauded. In fact, they are a public nuisance. Some men who were formerly employed by the Company still retain the title, but have, in fact, become merchants and purchase on their own account.

At Behar are a kind of brokers called Goldars, who must be carefully distinguished from the merchants of the same name. The Goldars of the town of Behar have no capital, except a warehouse and a set of weights, with which they accommodate those who employ them as agents, either

to buy or sell. They receive a commission of from one-quarter to one ser of grain on every rupee's worth that they sell. I have already mentioned a kind of merchants or agents named Aratiyas, but there are also Aratiyas, who keep commission warehouses; they receive various kinds of goods, according to their different inclinations, and dispose of these on commission. They are responsible for the proceeds and furnish the warehouse. On iron they get one-half per cent., on other goods 1 per cent. from each party. Some of them are agents, who purchase cloth for merchants residing at a distance.

Some bankers at Gaya and Daudnagar are called by the same name Aratiya. They grant bills for cash on Patna and Benares, charging half per cent. on the former, and one per cent. on the latter. They will also give money for good bills drawn on them from these two cities, but do not discount.

At Patna are 24 proper bankers (Kothiwalas), and one of them has a house at Gaya. They will all discount bills, payable either here or at Calcutta, Benares, and Moorshedabad. Some of them have also agents at Lucknow and Dhaka, one has an agent in Nepal, and the house of Jagat Seth has agents at Madras and Bombay in the south, and at all great towns within the Company's protection; but it has, I am told, withdrawn all the factories from the places under native anarchy. All the houses have extensive credit. Besides dealing in money, some of them trade in European woollen cloths, jewels, foreign spiceries, metals imported by sea, and the finer kinds of cloth of cotton, silk, and lace.

The Surrafs here exchange money, and purchase, and sell bullion. There are here no Fotdars, but many of the Surrafs have very petty capitals, and merely exchange silver and copper. In Patna, Gaya, and Behar, where their capitals are above 400 rs. they will exchange gold and silver. Everywhere silver may be procured for gold; but it is only in the capitals that gold is procurable for silver. The Surrafs lend money to those living on

monthly wages. The rich Surrafs and the Kothiwals supply the Zemindars, and pay the revenue, which operation is now their chief support.

Those who lend money are here called Nukudi-Mahajans and Ugahiya. Sums of consequence, such as 1000 rs. may, for this last year or two, be had for 12 per cent. a year, when bullion or jewels are lodged as security. Until then 15 per cent. was considered reasonable, and sums under 100 rs. cannot be even now procured at less than 18 or 20. Poor people in the country, who borrow on pledges of copper or silver, pay from one-half to one ana on the rupee a month. Traders often borrow from them, giving for 100 rs. a bond for 125, payable by equal instalments in 15 months.

A kind of usurers, called Athoyaras, lend 15 Gandas (60) of Paysas, and take a bond for 20 Gandas, that is 80, payable by weekly instalments of 4 Paysas. These people have no capital, but borrow from the Ugahiyas, and lend to petty hucksters, especially those who retail fish and vegetables.

Section III. Of the places where commerce is carried on.

In the index to the map, made on the same plan with that of Bhagalpur, a full enumeration of these has been given. From this it will appear that the number of weekly markets (Hats or Pethiyas) is much smaller in proportion to the number of people than in any of the districts hitherto surveyed, and a great part of the dealing is carried on by shopkeepers and the traders called Beparis. The number of Gunjes, or marts for exportation and importation is also very small, being confined to a few towns on the banks of the Ganges.

I am told that at all old established markets the Zemindars collect Tola, or a small share of every thing sold, which the people give without scruple, nor have they in any degree either benefited or become willing to benefit by the abolition of the duties which were formerly legally collected

for the use of government, and which, as I have said, they now continue to pay voluntarily to the Zemindars. I have no doubt in recommending that this tax, to which the people have been long habituated, and to which they would now submit without any scruple, should be revived, before the memory of old times has passed; and it may be modified and extended, so as in a little time to become productive of a considerable revenue. Although it is probable that here, as well as in Bhagalpur, each trade had a chief, and in many places such still remain, yet in many others they have almost entirely disappeared, and the want of municipal government is severely felt in all the towns, the police in which is exceedingly defective, especially in the total want of lighting, and in the most miserable neglect of streets, bridges, wharfs, cleanness, weights and measures. The protection of the lives and property of the subject from open violence or theft seem to have engrossed almost the whole attention of the police; nor has the success even in this been very considerable, although the depredations are by no means either so atrocious or numerous as they were in Dinajpur and Ronggopur when I visited these districts.

Section IV. Of Coins, Weights, and Measures.

Cash can at all times be readily had at Patna for bank-notes, sometimes without discount, and never for more than one-half per cent. The bankers also will supply bank-notes for cash, and usually require a premium of one-half per cent. Gold has almost totally disappeared, and $16\frac{1}{4}$ rs. are now required for the Ashrufi or gold mohur. Within these 17 years gold was the most common currency, and the Mohur then often fetched only 14 rs. I do not know exactly the reason of this change; but think it probable, that great quantities of gold are hoarded by some rich men at Calcutta, and by the Nawab Vizier. The gold is preferred as less bulky than silver. About three-quarters of the

silver is the Kuldar coinage of Calcutta, of which perhaps one-quarter is marked. The remaining quarter consists of the old rupees of Calcutta, Moorshedabad, and Patna. Both the marked Kuldars and the old rupees pass for whatever the money changers please, and in some country parts they have contrived that the old unmilled rupees of the 19th year should be preferred to the new milled currency, on which they actually levy an exchange. There are very few half or quarter rupees, the latter of which ought to be made the common currency, as being here a sum of at least as much importance as half-a-crown is in England. The money brought by pilgrims, which is of very considerable amount, is purchased by the bankers, and I presume is sent to the mint, as none remains in currency except in the town of Gaya, where a part remains in circulation until it can be purchased. Cowries are scarcely current, and the only small money in common use consists of copper Paysas, of which 56 most usually pass for a rupee. In Patna the Company's new Paysas, with a decent legend, is almost alone in use; but in the country a good many of the rude masses called Gorakpuri Paysas are still in circulation. At Gaya the Madhusahis are pretty common. The Government lately sent up Paysas to the value of 40,000 rupees, and distributed them at the mint price of 64 for the rupee, for which I know no good reason, as even this great influx lowered the exchange to only 58 for the rupee, and the fair at Hajipur will probably reduce them to 54; so that the persons, who took them from the collector, for two months' interest will have above $15\frac{1}{2}$ per cent. This fair, and the two months of marriage ceremony, usually raise the price of the copper about 4 per cent. There is as great a want felt from the size of the copper, as from that of the silver coin, and half and quarter Paysas would be a great advantage. Most things of little value, here as well as in Bhagalpur, are sold by an imaginary money called Taka, which is here reckoned equal to two Paysas. There are also imaginary monies called Chadam and Damri; the former is equal to 1 Paysa

or 25 cowries, the latter is equal to one-eighth of a Paysa.

The weights vary in almost every town, both in the ser and in the number of sers, that are contained in the man; but the standard is somewhat better ascertained. In general the Calcutta sicca weight is considered as the standard, but the Kuldar rupee is taken as the means of ascertaining this, which it does not exactly do, being a trifle less. In other places the Madhusahi paysa, is considered the standard, although, except at Gaya, etc. is seldom procurable. Both these standards are sometimes required, even in the same town, for the weights used in dealing in different commodities. Everything, except oil and milk, is sold by weight, and even oil, when sold by wholesale, is always weighed. The weights are all made of stone, and no regular attention has been paid to have them examined or stamped, although orders have been occasionally issued to have these operations performed; but in most places this has not been done for 10 or 12 years, and in some for 20; nor is any one molested for using such as are not stamped. I have indeed before-mentioned, that without proper standards the expedient of stamping is dangerous. It is supposed, that many of the weights now in use are fraudulent.

In every manor (Mawza), I have mentioned, that a hereditary weigher (Sonar), forms a part of the establishment, and not only weighs the crops when divided between the landlord and tenant, but whatever the merchant purchases; and it is by a commission from the merchant that these persons, and most of the manorial establishment are usually paid. This reconciles both master and tenant to the burthen, as the whole expense is nominally derived from the allowance given by the merchant to the weigher.

In some towns are men called Dandidars, who live by weighing commodities, and have apparatus for weighing at a time pretty large quantities, such as 2 mans or an hundred weight. At Gaya these weighers are paid one-half ser of grain for every rupee's worth that they weigh, or one-half ser of

grain for the man of Ghiu, 3 anas for weighing a load (4 mans) of tobacco, 2 anas for a load of sugar or iron, and 3 anas for a load of oil or salt. The man is about 82 lbs. The weighers in the country never weigh more at once than one Paseri, which should be 5 sers, as the name implies, but here, as well as in Bhagalpur, it often contains more. The scales of both kinds of weighers are very imperfect, and admit of the usual frauds. In the collector's office there is no standard for the land measure. In the account of the estates I have stated the different kinds in use. The land is measured by a rod as in Bhagalpur.

The cloth measure, upon which most dependence is to be placed, is the length of a man's arm, which forms the cubit, divided into seven Gerahs; but what is most commonly used is the Guz or yard. The Company everywhere uses a Guz of the same length, 18 of which are supposed to be 40 cubits long, so that each contains 40 inches; but in every vicinity the Guz used in the markets differs from the Company's, and from those used in other vicinities; and those in actual use are not made from any standard Guz, but by measuring a rod with the arm. It must be observed, that all cloths sold here in the bazaar are shorter, and in general narrower, than the sellers pretend. The most common cloth for instance, is called Sole-guzi because each piece should contain 16 yards; but few will be found that measure $15\frac{1}{2}$, many measure still less.

Section V. Concerning the Conveyance of Goods

As will appear from the account of the rivers a great part of these districts is destitute of water carriage; nor on the great river is the number of boats so great, as might have been expected.

At Patna and Danapur are kept a good many boats for the accommodation of the great in travelling, especially for the use of Europeans; and some persons of rank, both European and native, keep such for their own use. The boats are of two kinds, pinnaces and Bajras. The former are built somewhat after the European manner, with a keel, square stern, and bluff bows; but are very flat bottomed, and draw little water. The Bajras are on the native structure, have no keel, and are sharp at both ends. Both are square-rigged after the European manner, most usually as brigs; but they are so flat, that they can seldom sail, unless the wind be aft the beam; and, if there is much wind, they are usually blown on shore, and must proceed by tracking, even when going down the river. All have oars, but these produce little effect, and will by no means stem either wind or current; but they enable the people in calms to keep the boat in the current, or to cross from one side to the other. This however, is performed so slowly, that the boat in crossing is always swept far down the current. Their accommodations are excellent, and the traveller lives in them with almost every comfort, that he would have in a house. The hire here is vastly more reasonable than at Calcutta, especially for the pinnaces, which pay at the rate of 12 rupees a month for the oar, while the Bajras pay only 8. At Calcutta a 16 oared Bajra pays $5\frac{1}{2}$ rs. a day, and a pinnacle 10 rs. while they are most wretchedly found in stores and men, a 16 oared pinnacle having only 16 rowers and one steersman, whereas at Patna a 16 oared boat has a crew of 19 men. A few smaller boats, Bhauliyas and Pansis, are kept at Patna by indi-

viduals for their own use in travelling, but are not let for hire.

The boats used for the conveyance of merchandize are Ulak and Patelas, both of which have been already described, and those of both kinds, being of equal burthens, pay the same hire. The Ulaks of Patna are not near so neat as those of Bengal. Some very large have no cover, and are called Huliyas. The freight from Patna to Calcutta is usually from 12 to 15 rs. for the 100 mans of grain (76 s.w. a ser.) equal to about 7,800 lbs.; but in October 1812, owing to heavy losses by a storm in the preceding month it rose to 20 rs. Before that storm, boats were more easily procurable at Patna, than in any of the districts hitherto surveyed.

The Dinggis or open boats used in fishing, and as ferries, are exceedingly bad, and are mostly clinker-built. A very few canoes (Ekthas) are used, and come from Nepal. They are large, carrying 40 or 50 mans of grain, or from 312 to 390lbs.

Little or no advantage is taken of the immense torrents to float down any kind of commodity; and during the rainy season all internal commerce is at a complete stand, as the roads are then so bad, as not to admit of even cattle travelling with back loads. I have seen no country, that could be called at all civilized, where so little attention has been paid to this important object, and even in the vicinity of the two jails, where many convicts sentenced to labour are confined, very little has been done.

The cross roads from market to market are those which are chiefly wanted, and no one who has not seen the condition of these, could believe that a country so extremely populous and rich, and having such occasion for land conveyance, should be so ill provided. These roads ought to be made at the expense of the landholders, and especially in these districts by those who pay no revenue, and with care it would cost them very little. In many parts these roads might be formed by widening somewhat the banks used for collecting water for the cultivation of rice, and by connecting one of

these banks with another in the short intervals that are now between them. In parts of the country where there are few such banks, great advantage might result from compelling the landholders to make them, as it is in general owing to indolence and neglect that they have not been made. In the inundated parts of the district an equal advantage would arise from banks made to exclude the superfluous water, and where the country is not fit for rice and not inundated, the roads are kept up with little or no trouble. The object, as I have said in such roads, is not to enable gentlemen to drive their carriages, but to enable cattle carrying back loads to pass at all seasons from one market to another, and in the fair season to enable carts to do the same.

Except where hard materials are procurable on the spot, I believe the use of carts should be altogether prohibited during the rainy season; but in many parts of these districts stone is everywhere at hand. The natives here are fully sensible of the vast advantage attending the use of carts, in preference to back loads; and the roads through which I saw carts conducted, really astonished me. After the rice crop has been cut, until the rainy season commences, the ground is indeed everywhere so firm, that carts may be taken in almost every direction, a little levelling of banks and cutting of slopes into the channels of rivers is all that is necessary; but this can only be done by persons of rank travelling, and goods are not much conveyed in wheel carriages, except about large towns, and on the routes between Patna and Danapur, Patna and Gaya, Patna and Fehar, and Patna and Daudnagar.

Most of the carts are of the same structure with those at Puraniya, and the hire at Patna for a cart with two oxen, is from four to eight anas a day; with three or four oxen the hire is about 12 anas a day. At Gaya, the police has fixed the price at 20½ rs. a month, but this is to be understood of carts furnished to European travellers, or troops marching; natives pay only 15 rs. From Gaya to Patna a cart takes from 12 to 15 mans

(each 82 lbs.), and the hire to the merchant is three rupees; the distance is reckoned 72 miles.

Horses are not employed to carry loads, but a few asses or mules are loaded at Patna and Gaya. They are not let for hire. At most of the inns (Sarays), riding ponies are kept for hire, and let at 12 Paysas a day. Most of the goods are conveyed by oxen in back loads; nor in many parts is any other mode of conveyance procurable. The cattle to be let for hire are very numerous and pretty good, as they will usually carry about 250 lbs. 12 miles a day. The hire is from two to five anas a day. From Gaya to Patna (72 miles) the hire is five anas for the man of 82 lbs. Porters are only employed to carry goods from one place of a town to another, or to carry the baggage of travellers; they may be readily enough procured in towns, but in the country the traveller in general will find much difficulty. In some parts, indeed, the weavers are held bound to convey the baggage of travellers of rank, and receive a consideration from the Zemindar; for according to old custom, the Zemindars were formerly bound to provide travellers, at least such as were in the service of government, and they still are willing to assist, although I believe they are not legally bound.

The ferry-boats are in general very bad, and, except at Phatuha, where government defrays the expense and keeps excellent boats, I believe are left entirely to the discretion of the Zemindars, who make the most of them that they can, at the least possible expense. The police does not interfere farther than to compel the ferry-men to enter into engagements for the discovery of suspicious persons that attempt to pass. In some places it was stated, that where the Zemindar finds that boat, he takes two-thirds of the fare, and where the boat is found by the ferry-man, that the Zemindar is contented with one-third; and, I believe, he well may be so, as his right to any part is exceedingly doubtful. I heard of only one Sadabrata where strangers are received gratis, and it is almost entirely confined to the reception of Sannyasis, and belongs to the great convent of that order at Buddha Gaya.

The Khichri-furosh, who retail provisions, do not here receive strangers into their houses, and native travellers are in many parts a good deal diffculted to procure any accommodation. Men of a religious character will be generally taken into some temple or convent, but the profane in villages or small market towns must usually sleep under a tree, unless there is some shed for the accommodation of hucksters. In towns, some empty house is usually procurable, the difficulty not arising from churlishness, but from the jealousy of the men. There are however, scattered through the district many inns (Sarays) on the same footing with those in Bhagalpur. These are institutions highly deserving the encouragement of government, and were formerly so considered; but at present the keepers are left to their own exertions, and complain that the understrappers of police often use their accommodations without payment, and some inns have been abandoned owing to the trouble into which the keepers were thrown, in consequence of thefts committed within their premises. In the present state of the country, all that could be perhaps done, would be to secure a space sufficient for the inn by a good wall, and by two or three watchmen, to exempt the keepers from all taxes or ground-rent, and to direct the native officers of police to give them prompt assistance in case of complaints. For this purpose vague orders are not at all sufficient, but a copy of regulations should be suspended in the gate of each inn, and the Darogah should be held bound to send to the magistrate whatever person infringed them. The keepers here usually sell grass for horses, firewood, pots, tobacco, and the charcoal bulls used in smoking. Some sell shoes, and a great many let ponies to hire. At Daudnagar there remains a handsome saray of brick, but it has been converted into dwelling houses by the descendants of the person who built it, whose numbers can no longer be decently supported by the landed property which he left. This usurpation is therefore somewhat excusable, nor are such buildings necessary. The common huts erected by the Bhathiyaras are suffi-

cient for the present rude state of the country; but it is much to be wished that on all great roads, inns were established at regular distances, and secured from the depredation of thieves in the manner I have above mentioned. The expense might perhaps be defrayed by the sale of tobacco and betle, the exclusive privilege of retailing which near the inn might be farmed by one of the keepers. Here, as well as in Bhagalpur, are several bungaloes belonging to the invalid establishment, concerning which I have no occasion to make further remarks.

Shopkeepers, on the great road near the Ganges, extort heavy contributions from travellers. At Sherpur, for instance, situated in a most plentiful country, and sending all the produce by land to Danapur and Patna, I found provisions were sold at from one-sixteenth to one-fourth higher than in either of these two towns.

APPENDICES

APPENDICES

- I (a) Dr. Buchanan's list of statistical tables
- (b) Statistical Tables.
- II List of Buchanan drawings (Behar and Patna)

TABLE NO. 2

2. Proportion of inundated land in the Districts of Patna city and Zila Behar that is covered during the whole rainy season, and that is only occasionally covered.

Division.		Constantly under water or mere barren channels.	Regularly inundated throughout the rainy season.	Liable only to occasional floods, but every year covered for some days at least.	Entirely exempt from regular inundation
Patna city	...	2	3	few	15
Phatuha	...	9	50	49	37
Noubutpur	...	1	..	..	105
Bakipur-Jaywar	...	4	5	6	73
Sherpur	...	7	2	14	21
		23	60	69	251
Gaya	...	20	..	..	948
Nawada	...	12	..	..	941
Shekhpurah	...	4	3	6	585
Duriyapur	...	7	135	13	45
Bar	...	5	98	11	52
Behar	...	4	..	..	313
Helsa	...	22	67	22	246
Holasgunj	...	4	..	..	300
Jahanabad	...	2	..	34	240
Daudnagar	...	3	..	..	324
Arwal	...	8	..	..	253
Vikram	...	7	...	..	221
		98	303	86	4468
Total		121	363	155	4719

TABLE NO. 3

Statement of the number of pilgrims who have received licenses to worship at Gaya from the 1st May 1797 to 30th April 1811.

Years	Number of licenses issued for cash	Number of licenses of exemption issued as authorised by Government	Total number of pilgrims who have performed their religious ceremonies in the year
From the 1st May 1797 to the 30th April 1798 ...	17,577	93	17,670
From the 1st May 1798 to the 30th April 1799 ...	21,583	76	21,659
From the 1st May 1799 to the 30th April 1800 ...	14,371	189	14,560
From the 1st May 1800 to the 30th April 1801 ...	22,276	456	22,732
From the 1st May 1801 to the 30th April 1802 ...	18,581	383	18,964
From the 1st May 1802 to the 30th April 1803 ...	23,003	331	23,334
From the 1st May 1803 to the 30th April 1804 ...	13,975	215	14,190
From the 1st May 1804 to the 30th April 1805 ...	22,119	199	22,318
From the 1st May 1805 to the 30th April 1806 ...	19,646	3,645	23,291
From the 1st May 1806 to the 30th April 1807 ...	32,010	1,821	33,831
From the 1st May 1807 to the 30th April 1808 ...	21,994	10,429	32,423
From the 1st May 1808 to the 30th April 1809 ...	26,632	1,320	27,952
From the 1st May 1809 to the 30th April 1810 ...	26,663	791	27,454
From the 1st May 1810 to the 30th April 1811 ...	30,355	759	31,114

TABLE NO. 4

Estimate of the Population of the Districts of Patna City and Zila Behar, and of some of the causes by which it is affected.

Division or Thana.	Sects.			Employments.			Health.						Number of marriageable girls remaining single at 15 years of age.	Houses occupied by prostitutes.		
	Muslims.	Hindus.	Total.	Gentry.	Piebeians.		Proportion of those who have adopted inoculation.	Proportion of those who are annually supposed to have fevers.	No. of persons who have the leprosy called Kor.	No. of persons who have the leprosy called Charka.	No. of persons who have the disease called Tilpay.	No. of persons who have the disease called Ghag.			No. of persons who have the disease called Koranda.	
					Traders.	Artificers.										Ploughmen or day labourers.
Patna City	97500	214500	312000	138000	30000	78000	66000	11	3	250	130	160	450	1350	400	600
Phatuha	23175	75525	100700	34600	3150	12600	50350	14	5	200	80	4	100	200	1000	5
Noubutpur	31200	52000	83200	24700	2600	5200	50700	13	2	200	40	...	5	50	200	3
Bakpur-Jaywar	30770	52400	83170	30350	5520	11550	35150	8	2	110	55	3	25	400	65	25
Sherpur	15100	15100	30200	3800	950	2850	22100	12	4	100	50	2	20	200	60	...
	199745	409525	609270	232050	42220	110200	224800	11	2	860	355	169	600	2200	1725	633
Gaya	169425	232775	451800	70600	14100	28250	333850	15	3	200	100	10	30	150	300	125
Nawada	23175	347625	370800	97500	1000	4150	263150	15	4	500	200	40	25	200	1000	14
Sheykpurah	103775	326325	435100	150850	1000	11700	271550	15	2	200	50	25	30	100	500	7
Duriyapur	15069	105481	120550	30100	1900	7550	81000	15	2	200	30	4	5	8	200	10
Bar	24237	72713	96950	86350	1500	6100	53000	15	4	200	40	2	...	100	150	8
Behar	76493	127437	203900	38250	950	15900	140200	4	2	400	200	10	...	200	1200	10
Helsa	63550	196650	262200	65550	4100	12900	180200	15	2	1000	50	5	...	250	2000	25
Holasguni	48425	143275	193700	45400	3000	12100	153200	15	2	30	10	...	...	150	200	15
Jahanabad	78275	132125	211400	59450	3300	16500	132150	15	1	300	40	...	...	100	600	16
Daudnagar	60225	100375	160600	35150	10000	15000	100450	14	2	200	100	3	5	50	100	150
Arwal	28050	44150	72200	29500	500	1050	81150	14	2	300	50	...	...	50	40	7
Vikram	25490	110460	135950	44700	600	1300	89350	15	2	250	50	1	...	60	200	4
	724159	2030991	2755150	703400	50550	131900	1869300	14	2	3730	920	100	122	1418	6490	391
Total	928904	2440516	3364420	935450	92770	242100	2094100	13	2	4640	1275	269	722	3618	8215	1024

TABLE NO. 6

Estimate of the number of houses in the district of Patna city and Zila Behar founded on the report of the native officers and other intelligent persons.

Division or Thanah.	Gentry.	Traders.	Artificers.	Ploughmen.	Total.
Patna city ...	23000	5000	13000	11000	52000
Phatuha ...	9730	940	2598	14152	27420
Noubutpur ...	4108	489	809	8133	13839
Bakipur-Jaywar...	7845	1162	2431	9163	20601
Sherpur ..	1155	264	891	6924	9234
	45838	7855	19729	49672	123094
Gaya ...	15000	2746	9011	72000	98757
Nawada ...	18100	1412	3678	50600	74120
Sheykhpurah ...	12695	1411	3665	22851	40625
Duriyapur ...	6084	748	1154	16350	34336
Bar ..	10170	719	1395	14842	27126
Behar ...	19035	3352	10563	69795	102745
Helsa ...	30480	3342	4278	83820	121920
Holmgunj ...	10095	937	2428	29612	43072
Jahanabad ...	13891	1089	3542	30870	49392
Daudnagar ...	13008	1919	6138	30894	51989
Arwal ...	5718	503	1378	22872	30471
Vikram ...	12955	400	2191	25910	41456
	167531	18641	49421	470416	706009
Total ...	213369	26496	69150	520088	829103

TABLE NO. 7 (Continued)
Continuation of the foregoing table.

	Families of 6 persons.					Families of 5 persons.					Families of 4 persons.				Families of 3 persons.							
	40 R.	16 to 30 R.	10 to 15 R.	7 to 9 R.	6 R.	5 R.	3 to 4½ R.	15 to 20 R.	11 to 14 R.	10 R.	7 to 8 R.	4½ to 6 R.	3 to 4 R.	8 to 12 R.	5 to 7 R.	3 to 4 R.	2 to 2½ R.	6 to 10 R.	4 to 5 R.	3½ to 3 R.	2½ to 3 R.	1½ to 2 R.
Patna City	...	2000	4000	...	6300	...	...	3000	4000	...	949	6500	...	2540	3500	4000	...	460	1500	...	4000	...
Phatnhs	...	1424	1779	...	2491	...	...	...	712	...	...	2136	...	178	356	889	...	47	95	...	333	...
Noubutpur	188	...	...	...	...	...	...	...	62	...	...	94	282	375	...	75	...	175	...
Bakipur-Jaywar	...	541	901	...	1441	470	845	...	720	...	...	1261	...	...	360	1081	...	...	180	...	540	...
Sherpur	...	208	345	...	555	...	...	805	970	...	...	805	...	...	415	558	323	92	...	...	461	...
Gaya	...	2864	4774	...	763	...	...	5728	...	...	7161	...	...	...	3246	4298	...	238	954	...	2626	...
Nawada	1976	4890	...	8804	...	989	...	...	5868	7385	10025	1050	3423	4401	...	...	...	3423	...	
Sheykhpurah	...	1090	3364	...	...	...	13358	...	...	...	5944	...	...	...	1979	...	1484	...	489	...	940	...
Duriyapur	836	4180	...	...	...	...	...	...	627	...	1045	1672	...	...	...	626	...	42	...	63	104	...
Bar	...	1589	2665	...	...	...	...	...	1790	...	2001	...	...	...	...	1867	...	...	425	...	1442	...
Behar	...	1342	3356	6042	...	...	...	...	...	3050	2238	3134	...	...	984	1701	...	458	...	...	850	...
Helsa	...	1830	...	...	3050	...	4880	...	...	...	670	4573	4575	915	...	2745	...	...	...	...	610	1371
Holasgunj	1571	2095	...	...	4714	...	...	...	...	1005	3762	...	209	418	1885	...	...	...	125	713
Jahanabad	555	1717	...	6822	...	...	...	...	1414	5154	...	505	757	2780	...	...	...	254	1270
Daudnagar	...	685	1025	...	...	...	3771	...	...	771	...	1026	2316	...	86	172	1118	...	...	...	343	...
Arwal	2036	2845	...	1626	...	...	...	841	...	600	...	241	723	...	...	...	60	180	...
Vikram	655	1145	...	819	...	...	...	...	219	1531	...	...	350	962	...	...	...	154	285
	836	17763	25739	16461	19747	16912	36835	10522	8819	5154	26717	33625	48978	3490	16719	24863	3922	1337	3812	123	16560	3639

Total—Patna city 52000; Phatua 15235; Noubutpur 5259; Bakipur-Jaywar 11533; Sherpur 5935; Gaya 60651; Nawada 62696; Sheykhpurah 63534; Duriyapur 13434; Bar 17118; Behar 29143; Helsa 39057; Holasgunj 26536; Jahanabad 32399; Daudnagar 22043; Arwal 15447; Vikram 14011. Grand total 439831.

TABLE NO. 3
Estimate of the manner in which the people of Patna city and Zila Behar are lodged.

Divisions or Thanahs.																		
	Patna city	Phatua.	Noubutpur	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhbpurab.	Duriyapur.	Bar.	Behar.	Helsa.	Holagunj.	Jahanabad.	Daudnagar.	Arrah.	Vikram.	Total
Families that are partially or in whole accommodated in houses built of brick ...	7200	100	1	30	1	2550	10	2	1	22	500	25	1	3	15	...	3	10464
In mud walled houses of two stories covered with tiles ...	11750	470	15	150	25	1200	50	...	...	1	2000	250	50	200	2000	25	200	18386
In mud walled houses of two stories covered with thatch ...	50	...	45	150	...	800	500	3931	500	700	2500	1000	818	few	1251	125	200	12570
In mud walled huts covered with tiles...	22000	1408	100	2800	400	1794	500	25	...	1	3000	1200	200	400	2503	40	300	36671
In mud walled huts thatched with grass	11000	4700	2012	8403	1626	14349	30818	43249	11317	16194	3280	35982	6546	3849	12518	7528	1900	215271
In mud walled huts thatched with stubble	...	7517	6036	...	3168	39458	19261	13761	...	...	17499	...	18921	26947	3756	7529	11408	175161
In huts with walls or hurdles and covered with thatch ...	...	940	...	...	685	...	7705	1966	1616	200	...	...	...	...	...	...	...	13112
In huts like bee hives	...	100	50	...	30	500	3852	600	...	...	364	600	400	1000	few	200	few	7693
Total...	52000	15235	8259	11333	5935	60651	62696	63534	13434	17118	29143	36057	26836	32399	22043	15447	14011	489331

TABLE 9 (Continued)
Continuation of the foregoing Table.

	Division or Thanah.																
	Patna City.	Phatna.	Noubaupur.	Bakipur-Jaywar	Sherpur.	Gaya.	Nawada.	Sheykhupura.	Bar.	Behar.	Helsa.	Holagunj.	Jahannabad.	Daudnagar.	Arwal.	Vikram.	
Men who use unbleached cotton cloth alone, but the cloth is very small, and is called Langgoti	few	8-64	16-64	few	40-64	16-64	8-64	12-64	few	8-64	2-64	4-64	8-64	24-64	8-64	24-64	16-64
Families, the heads of which sleep on bedsteads with curtains (Palang)	1-64	20	4	50	10	200	20	50	20	25	200	10	10	200	15	1	
Families, the heads of which sleep on wooden bedsteads (Charpayi) without curtains, but with turned feet	11-64	8-64	4-64	2-64	4-64	2-64	8-64	16-64	12-64	8-64	4-64	200	4-64	200	6-64	8-64	2-64
Families, the heads of which sleep on very coarse wooden bedsteads (Khataiya)	20-64	24-64	20-64	38-64	20-64	60-64	40-64	24-64	20-64	40-64	52-64	24-64	28-64	36-64	42-64	20-64	20-64
Families which in the cold season sleep on sackcloth, blankets or sutrunj, and in summer on mats	16-64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Families which sleep on coarse mats made of reeds, grass, straw, Khajur, or palmira leaves	16-64	32-64	40-64	24-64	40-64	2-64	16-64	24-64	32-64	16-64	8-64	40-64	32-64	28-64	16-64	36-64	42-64
Families that anoint themselves almost daily with oil	...	...	20-64	...	...	few	...	20	...	...	...	...	...	...	...	...	...
Families that anoint themselves once or twice a week	24-64	16-64	32-64	4-64	8-64	16-64	12-64	1-64	16-64	16-64	16-64	4-64	8-64	some	48-64	48-64	48-64
Families that use oil for unction only on great occasions	40-64	48-64	12-64	60-64	56-64	48-64	48-64	48-64	48-64	48-64	48-64	48-64	40-64	40-64	16-64	16-64	16-64
Families that use essence only on great occasions	16-64	4-64	few	200	10	4-64	few	50	few	50	200	100	200	1-64	5	15	

TABLE NO. 10.
An estimate of the manner in which the people of the District of Patna City and Zila Behar are fed.

	Patna city.	Phatuhah.	Noubaupur.	Bakipur-Jaywar.	Sherpur.	Gayah.	Nawadah.	Sheykhipurah.	Duraisapur.	Bar.	Behar.	Holagunji.	Jahanabad.	Daudnagar.	Arwal.	Vikram.
Families that eat meat daily ...	4-64	4	...	100	...	4-64	5	25	few	10	1000	25	...	50	5	...
Families that eat meat from two to ten times a month	36-64	16-64	4-64	12-64	4-64	16-64	4-64	10-64	...	16-64	8-64	16-64	4-64	16-64	24-64	4-64
Families that sacrifice on great occasion only ...	12-64	40-64	58-64	36-64	24-64	36-64	52-64	44-64	56-64	40-64	52-64	44-64	56-64	32-64	32-64	56-64
Families that cannot afford meat on any occasion, or that reject its use ...	12-64	8-64	2-64	16-64	36-64	8-64	8-64	4-64	8-64	8-64	4-64	4-64	4-64	16-64	8-64	4-64
Families that have as much fish as they please	1-64	100	...	150	...	...	...	...	...	...	...	...	...	...	...	...
Families that have fish daily on the cheap season alone, and in the dear season procure it only sometimes ...	42-64	16-64	24-64	16-64	32-64	16-64	16-64	24-64	24-64	16-64	8-64	16-64	16-64	2-64	16-64	16-64
Families that have only what fish they can catch themselves ...	3-64	40-54	36-64	32-64	16-64	40-64	40-64	36-64	32-64	40-64	52-64	44-64	44-64	46-64	40-64	44-64
Families that reject fish ...	12-64	8-64	4-64	16-64	16-64	8-64	8-64	4-64	8-64	8-64	4-64	4-64	4-64	16-64	8-64	4-64
Families that can use ghni Fa(butter) whenever they please ...	16-64	8-64	50	16-64	4-64	24-64	1-64	8-64	1-64	40-64	24-64	100	8-64	16-64	8-64	4-64
Families that use milk daily	8-64	12-64	4-64	16-64	16-64	24-64	4-64	8-64	16-64	8-64	16-64	12-64	16-64	24-64	16-64	8-64

An estimate of the manner in which the people of the District of Patna City and Zilla Behar are fed.—*Contd.*

Division or Thanah.

	Patna city.	Phatua.	Noubutpur.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhpurah.	Burhampur.	Bar.	Behar.	Helsa.	Holagunj.	Jahanabad.	Daudnagar.	Arrah.	Vikram.
Families that use cultivated vegetables seldom ...	36-64	46-64	40-64	40-64	42-64	32-64	43-64	46-64	47-64	56-64	16-64	43-64	40-64	23-64	23-64	40-64	26-64
Families that can afford to purchase foreign spices ...	49-64	32-64	43-64	56-64	16-64	44-64	17-64	26-64	32-64	34-64	43-64	16-64	20-64	36-64	52-64	24-64	32-64
Families that procure oil in abundance ...	1-64	8-64	8-64	3-54	4-64	8-64	1-64	2-64	16-64	8-64	16-64	4-64	100	8-64	2-64	2-64	2-64
Those that have a moderate allowance of oil ...	35-64	32-64	24-64	16-64	20-64	16-64	4-64	16-64	16-64	40-64	16-64	20-64	16-64	16-64	8-64	20-64	10-64
Those that procure oil scantily ...	23-64	24-64	32-64	40-64	32-64	24-64	56-64	46-64	32-64	16-64	32-64	23-64	32-64	40-64	54-64	36-64	32-64
Families that procure oil only occasionally ...	few	...	...	few	8-64	16-64	3-64	200	few	few	few	12-64	16-64	few	few	...	20-64
Families that have salt in abundance ...	8-64	2-64	8-64	4-64	4-64	12-64	1-64	2-64	16-64	8-64	16-64	100	100	8-64	4-64	8-64	2-64
Families that procure a stinted allowance of salt ...	32-64	8-64	24-64	20-64	20-64	20-64	4-64	16-64	16-64	40-64	26-64	24-64	16-64	16-64	28-64	20-64	20-64
Families that procure a scanty allowance of salt ...	16-64	54-64	32-64	40-64	32-64	32-64	56-64	44-64	32-64	16-64	32-64	23-64	32-64	40-64	32-64	36-64	40-64
Families that procure salt in very small quantities ...	5-64	...	few	few	8-64	few	3-64	2-64	few	few	...	12-64	16-64	few	few	...	2-64
Families who use rice two times daily, with wheat cakes occasionally as a variety ...	32-64	8-64	24-64	23-64	8-64	43-64	37-64	8-64	4-64	16-64	60-64	16-64	16-64	whole	32-64	32-64	24-64

TABLE NO. 12

An estimate of the manner in which the people of Patna city and Zila Behar are supplied with fuel and light.

	Division or Thanah.											
	Patna city.	Phatua.	Nouhutpur.	Bakipur.	Sherpur.	Gaya.	Nawada.	Sheykh-purah.	Duriyapur.	Bar.	Behar.	Holsa.
Fire wood ...	24-64	8-64	4-64	16-64	4-64	24-64	16-64	24-64	4-64	4-64	4-64	1-64
Bushes and reeds	24-64	...	...	...	...	few	...	40-64	24-64	60-64	60-64	...
Straw husks and stems of crops ...	16-64	...	...	...	...	...	...	...	...	...	...	...
Cowdung and husks	...	56-64	60-64	48-64	60-64	40-64	48-64	...	36-64	...	...	...
Mustard seed oil	few	8-64	4-64	4-64	4-64	36-64	60-64	8-64	...	8-64	40-64	...
Linseed oil usually mixed with that of	48-64	16-64	16-64	32-64	12-64	16-64	...	48-64	...	...	20-64	...
Poppy seed	...	...	...	...	...	2-64	...	...	...	...	...	...
Sesamum oil	...	...	...	...	...	...	...	...	...	...	...	...
Castor oil or that of the Ricinus	16-64	36-64	44-64	16-64	40-64	6-64	4-64	8-64	60-64	48-64	2-64	...
Oil of safflower or Carthamus	...	4-64	few	4-64	6-64	...	...	...	4-64	8-64	...	...
Poppy seed oil	...	...	...	8-64	2-64	2-64	...	...	...	...	2-64	...
Mahuya seed oil	...	...	...	...	...	2-64	...	...	...	...	...	...
Surguja oil	...	...	...	...	...	...	...	...	...	...	...	...
Families who burn a lamp all night	6-64	8-64	few	2-64	1-64	2-64	150	2-64	4-64	few	2-64	100
Families who burn a lamp to midnight	16-64	16-64	8-64	24-64	4-64	8-64	4-64	4-64	8-63	8-64	4-64	1-64
Families who burn a lamp seven hours and a half	24-64	28-64	16-64	16-64	16-64	32-64	24-64	10-64	12-64	16-64	16-64	4-64
Families who burn a lamp from two to four hours	16-64	12-64	40-64	22-64	43-64	22-64	33-64	47-64	40-64	40-64	42-64	...
Families who burn a lamp when they take supper	2-64	few	...	few	59-64
Families who burn torches or straw at supper.	3-64	1-64	few

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TABLE NO. 13

An estimate explaining the extent of luxury in attendance and conveyance in the districts of Patna city and Zila Behar.

	Division or Thanah.																			Total.
	Patna city.	Patna.	Noubutpur.	Bakipur.	Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhpurah.	Durayapur.	Bar.	Behar.	Holsa.	Holagunj.	Jahanabad.	Daudnagar.	Arwal.	Vikram.		
Time Elephants	24	...	...	...	...	...	40	3	2	2	2	3	4	...	...	...	1	3	3
Camels	5	...	...	...	...	...	30	...	...	...	2	...	...	...	...	...	3	...	...
Saresa or other large horses	277	120	17	100	...	...	1160	...	...	15	50	...	25	25	25	250	100	106	2925
Ponies of the kind called Tatus	515	50	100	150	100	...	3500	300	200	250	300	800	400	200	1500	1000	250	150	9215	
Rath or four-wheeled carriages drawn by oxen	44	...	...	2	...	1	12	1	...	...	5	2	3	1	...	4	...	...	75
Carriages with two wheels drawn by one horse and called Ekka	418	15	...	20	...	2	10	...	...	...	6	...	...	...	...	...	...	...	471
Majholi and Raharu two wheeled carriages drawn by oxen	236	10	...	20	...	...	50	9	...	...	40	8	5	4	...	100	10	15	507
Palanquins	632	280	51	135	...	29	988	218	515	70	220	254	180	60	150	300	160	170	4412	
Male free domestic servants	4100	300	50	100	40	1000	400	300	25	150	500	100	100	200	200	400	100	100	8065	
Female free domestic servants	4000	100	10	50	...	...	40	...	12	5	10	150	...	25	...	100	...	...	4502
Men slaves entirely domestic	1000	125	...	25	30	3000	...	...	...	...	50	...	300	...	25	...	...	500	5055
Men slaves partly employed in agriculture	100	125	220	125	...	...	3000	500	250	...	200	2100	125	100	475	1800	150	...	9270
Do. do. employed entirely in agriculture	...	1750	250	500	70	...	1500	1250	1500	750	5900	675	700	500	500	1200	450	1500	18495	
Poor women who bring water to wealthy families	2500	300	200	100	50	700	300	...	...	...	100	...	50	50	125	500	100	100	5175

TABLE NO. 14
Explanatory of the state of education in the district of Patna city and Zila Behar.

	Division or Thanah.																Total.	
	Patana city.	Phatua.	Noubutpur.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhpurah.	Duriyapur.	Bar.	Behar.	Helsa.	Holasingunj.	Jahanabad.	Daudnagar.	Arwal.		Vikram.
Men fit to act as writers born in the division	6500	1700	500	800	140	1800	800	500	300	1500	4700	1100	1300	1600	1800	350	500	25890
Employed at home	1500	450	50	200	43	700	400	200	130	400	700	350	320	400	700	115	220	6878
Employed abroad	1000	150	45	100	27	250	250	150	10	300	380	120	325	300	200	5	130	3797
Not employed	4000	1100	405	500	70	850	150	150	160	800	3620	630	660	900	900	170	150	15215
Strangers employed here as writers	800	50	35	40	5	450	80	150	10	65	45	65	115	200	100	35	55	2300
Strangers waiting for employment	400	...	10	...	...	300	...	...	...	...	...	...	...	...	...	...	...	710
Men belonging to the district employed in the regular army	200	125	5	25	50	50	50	100	20	50	25	25	10	125	40	150	100	1150
Employed in the police or revenue	1300	300	20	150	100	250	250	200	20	125	500	200	100	500	400	50	80	4545
Employed abroad in the police or revenue	1000	625	80	100	90	500	250	350	25	100	250	150	120	500	300	125	70	4635
Not employed	3500	3809	516	500	185	2200	1960	1450	55	1070	3643	1220	1780	2025	1372	1930	875	28090
Strangers employed in the police or revenue	500	100	30	50	50	400	125	150	17	25	60	65	35	500	70	70	25	2272
Strangers waiting for employment	300	...	40	...	...	200	...	...	...	...	...	...	...	...	...	...	...	540

TABLE NO. 15

Number of Hindu Academicians in the districts of Patna City and Zila Behar and their Scholars.

Grammar 2; Do. and Legend 4; Astrology 5; Do. 4; Do. 3; Grammar and Legend 4; Do. do. 6; Grammar 4; Do. and Law 4; Do. do. 12; Grammar, Law and Legend 4; Grammar and Medicine 3; Grammar 2; Do. and Medicine 4; Grammar 4; Do. 4; Do. and Astrology 4; Do. and Law 5; Astrology 2; Grammar 2; Do. and Legend 4; Do. and Law 0; Grammar 4; Do. 5; Astrology 15; Grammar 4; Do. 2; Do. 3; Do. and Legend 5; Do. and Medicine 5; Grammar 4; Do. 5; Do. and Astrology 5; Do. do. 5; Do. and Medicine 5; Do. and Magic 2; Do. and Law 10; Do. and Legend 8; Metaphysics and Grammar 10; Grammar 4; Do. and Law 4; Do. and Legend 4; Do. do. 6; Do. do. and Law 6; Grammar 4; Do. 4; Do. 15; Do. 10; Do. 2; Do. 10; Do. 2; Do. 4; Do. 3.

Explaining the manner in which the cultivated lands of the District of Patna city and Behar are occupied.—(Contd.)

Division or Thanah.

	Patna city.	Phatubha.	Nouabpura.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhupura.	Duriyapur.	Bar.	Behar.	Helsa.	Holagun.	Jahanabad.	Daudnagar.	Arwal.	Vikram.	Total.
Broadcast Maruya followed by Wheat	—	150	...	...	...	...	...	...	...	800	...	...	...	...	...	...	...	950
Do. do. Turi	...	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	200
Do. mixed with Bhadal Urid	...	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2300
Do. do. Arahar	20	100	...	...	250	...	...	...	...	500	...	4700	...	300	...	1500	...	11970
Do. do. Arahar and Urid	500	...	...	...	...	...	...	500	...	1000
Do. do. Arahar and Cotton	600	...	...	...	...	...	...	...	600
Do. do. Arahar and Ricinus	500	...	...	...	...	...	...	...	...	1250
Do. do. Arahar, Barrosa Cotton & do.	200	...	...	...	...	...	...	...	500
Do. do. Cotton and Ricinus	750	400	...	...	...	...	...	...	...	200
Do. do. Barrosa Cotton	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	60	1210
Do. do. Beans or Sim	...	400	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20
Do. followed by Poppy	400
Do. do. mixed with Safflower	1200	5800	1200	3600	1700	500	600	39670
Transplanted Maruya by itself	...	700	120	250	...	9500	5400	2000	...	...	800	...	400	300	400	...	...	2700
Do. followed by Masur	...	700	240	100	...	900	1750	3300	...	...	2000	1400	1200	600	1700	250	1500	12640
Do. do. pease	100	...	...	...	...	100
Do. mixed with Arahar	1200	...	...	...	...	...	...	5050
Do. do. Urid	4100	7000	4100	600	3375	2700	1800	33175
Do. followed by But	...	1800	...	250	...	1800	900	...	...	...	...	...	...	...	...	...	...	2300
Do. do. Barley	...	1500	...	600	200	5000	...	1300	...	...	...	...	...	300	...	...	...	3500
Do. do. Barley mixed with pease	2000	...	...	...	...	...	...	...	...	...	...
Do. do. do. But	200	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. do. Wheat	240	200	...	4400	3300	...	...	2500	3700	4100	600	6750	1500	900	31590
Do. do. Turi and Ratai	100	...	900	6700	...	...	...	900	400	...	...	250	300	1850
Do. do. Sarsa	100	300	...	...	400	...	...	200	200	100	...	1550
Do. do. Rarhiya Cotton	20	...	...	350	...	...	...	...	...	...	...	...	...	1350
Do. mixed with Bhoga Cotton
Do. followed by Poppy mixed with safflower	60	150	...	...	...	...	...	...	20	...	800	...	...	...	200	400	200	2680

Explaining the manner in which the cultivated lands of the District of Patna city and Behar are occupied.—(Contd.)

[illegible]

Explaining the manner in which the cultivated lands of the District of Patna city and Behar are occupied.—(Contd.)

Division or Thanah.

	Patna city.	Phatua.	Noubtupur.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhpurah.	Duriapur.	Bar.	Behar.	Helsa.	Holasgunj.	Jahanabad.	Daudnagara.	Arwal.	Vikram.	Total.
China Jethuya	150	...	...	...	...	...	...	...	...	...	100	...	40	...	...	...	...	290
Do. (Bhadai)	...	50	100	...	...	200	...	...	...	...	...	...	...	...	...	...	...	200
Do. (Magra)	...	350	1400	6000	4000	75000	105000	67000	74000	20200	23700	18800	33000	12600	47400	10000	10900	1675
Wheat by itself	60	1800	...	...	1000	...	...	...	...	2000	...	...	100	1400	5000	2000	3100	512560
Wheat mixed with But	...	...	700	...	...	...	...	...	...	200	...	...	...	...	...	...	...	17120
Do. mixed with pease	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	21000
Do. mixed with	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Barley (Gujai)	10	900	...	600	20	...	4500	3300	5200	...	...	400	1200	1800	3400	1300	3100	20530
Do. mixed with sarso	...	90	...	1200	25	...	...	...	...	200	...	2300	800	300	...	...	1500	15705
Barley by itself	...	14000	350	9400	250	3800	10500	6600	10400	12000	28700	28000	24750	10800	27000	11000	31000	231200
Do. mixed with pease	50	...	...	1700	250	9500	2700	3300	18200	12000	4000	9400	6200	7200	1000	...	3100	87600
Do. mixed with But	20	11000	9000	2500	250	3800	4500	13400	7800	2000	8000	4700	2000	1800	6700	2600	9800	86170
Do. mixed with But & Linseed	...	3500	5800	...	100	...	...	...	...	...	...	...	...	...	...	...	...	3600
Do. mixed with Sarso	...	...	...	...	...	...	...	...	...	1000	...	...	...	...	...	...	...	1000
Masur by itself	20	9200	...	7000	800	19000	9000	10000	10400	6000	10000	9400	10300	5800	19000	4400	3100	134820
Do mixed with Linseed	10	3500	1400	2400	250	9500	3600	3300	5200	1000	2000	2300	2000	1400	6700	1100	3100	63360
Do. mixed with pease	...	...	16000	...	...	...	...	500	...	...	...	...	...	...	...	...	...	500
Do. mixed with Barley	...	...	...	...	...	...	...	...	...	1000	...	...	...	...	...	...	...	1000
Field pease (Hara Sugiya)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
by themselves	100	5000	4250	2000	1000	9500	18000	16800	10400	8100	8000	7000	6200	1800	6750	1600	2500	109000
Pease sown among the stubble	...	...	...	...	...	...	...	20000	...	...	2000	...	...	...	...	...	...	22000
Field pease (Kabali) by themselves	100	7000	2900	6000	500	950	900	10000	36500	8100	4000	2300	2000	10800	5000	500	1800	107450

Explaining the manner in which the cultivated lands of the District of Patna city and Behar are occupied.—(Contd.)

APPENDICES

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Division of Thanah.

	Patna city.	Nouabpnr.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhbpur.	Duraispur.	Bar.	Behar.	Helsa.	Holagrunj.	Jahanabad.	Daudnagar.	Arraj.	Vikram.	Total
Pease sown among the stubble	..	..	..	..	..	..	300	..	..	..	..	..	..	..	..	..	300
Field pease (Dabli) by themselves	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7700
Pease mixed with Sarso	..	..	1200	500	..	4500	..	..	2000	..	..	..	..	..	..	5000	7700
Khesari sown among the stubble	..	..	..	..	19000	..	39845	4000	4000	..	..	..	..	..	..	..	61945
Ararab by itself	..	700	100	..	9500	100	350	..	4000	400	400	500	300	400	..	..	17150
Do. mixed with Urid	..	..	..	..	4700	100	..	..	..	..	1000	100	1400	..	400	100	7400
Do. mixed with Kudram	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4700
Kulthi by itself	..	1400	100	50	15000	9000	35	4200	6000	4000	200	2000	1800	1350	11000	9900	77625
Urid Bhadaei	..	..	100	20	1750	900	..	..	..	50	..	..	..	300	200	400	3600
Bhringgi or Mothi	..	..	..	..	..	..	..	..	..	..	..	..	..	6750	400	3100	10380
Mashkalai by itself	..	..	..	..	..	..	..	..	1000	..	400	..	..	..	40	..	2150
Mung or Sehamung by itself	..	150	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11340
But or Chana by itself	25	100	20	..	5000	375	50	..	..	..	40	50	2000	3400	200	80	298200
But mixed with Linseed	100	28500	9400	800	55000	26500	26800	13000	12000	8000	11700	14500	10800	27000	18000	18600	61150
But Kabali by itself	50	14000	2400	1200	4000	9000	..	..	2000	..	2300	2000	1800	13500	2700	6200	2000
Bora or Ghagra	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40
Turi Ratai by itself	..	..	..	..	..	40	..	..	..	..	..	..	..	..	..	..	90700
Sarso by itself	50	1800	3500	2000	4000	13500	13500	10500	4000	2000	2300	2000	5000	6750	6700	6200	80750
Rayi or Mustard by itself	..	900	1200	..	1000	27000	20000	..	200	6000	4700	8150	1800	3100	2700	3100	11775
Rayi sown in the mud without culture	..	600	50	25	..	4500	5200	..	1000	..	400	..	..	..	..	..	3900
	100	200	50	..	..	..	..	2800	400	..	400	..	..	..	..	..	..

APPENDICES

Explaining the manner in which the cultivated lands of the District of Patna city and Behar are occupied.—(Contd.)

	Division or Thanah.															Total.		
	Patna city.	Phatna.	Noubutpur.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhpurab.	Duriyapur.	Bar.	Behar.	Helsa.	Holagunj.	Jahanabad.	Daudnagar.		Arwal.	Vikram.
Linseed by itself	..	3500	700	..	..	9500	4500	20000	2000	2000	4000	7000	..	..	10000	1350	3100	68250
Til by itself	50	..	..	500	550	..	25	200	..	50	..	..	200	..	..	1575
Kudrum by itself	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	40
Son or Sanayi	..	30	..	..	10	30	..	..	..	..	150	..	..	..	..	..	..	240
Tobacco by itself	20	..	45	190	..	..	..	20	100	..	50	..	505
Bottle leaf	10	25	10	..	10	10	..	..	..	..	..	..	65
Sugarcane Mango	80	..	..	350	2000	180	..	80	750	400	400	400	60	13	..	4713
Do. Ketari	120	..	..	900	100	40	..	58	2000	900	450	1000	40	10	400	6968
Sugarcane Barukha	100	..	20	400	500	280	..	50	1750	600	950	500	..	..	800	8000
Sugarcane Reongra	10	80	75	100	..	10	200	100	100	100	..	..	1600	1610
Do. Sakarchiniya	10	..	..	..	..	..	765	..
Do. Paungdi	10
Cotton Barsha	1400	..	..	2000	1100	..	..	400	650	200	..	..	200	..	200	6150
Do. Jasur	40	..	..	..	..	..	..	..	..	..	..	40
Do. (Bhiyara)	40	..	..	..	..	..	..	..	..	140
Do. Rarhiya	..	40	1400	..	..	..	1200	..	..	100	500	750	..	..	500	100	400	4990
Do. mixed with pease	3000	..	..	..	..	..	..	..	..	..	60	..	3000
Do. mixed with Sarso	500	..	..	..	..	..	..	500
Do. mixed with Sarso and	90
pease (Hara)	40	50	..
Do. mixed with Sarso and	700	..	..	..	350	..	..	..	..	..	..	1050
pease (Kabali)	140
Indigo by itself	40	..	..	..	..	..	100	..	..	..	..	..	..	..	..	..
Phaguniya Baok	1000	5245
Do. Ashariya Baok,	60	50	..	..	45	5	200	2000	15	750	10	10	..	..	1100	..
1st year
Do. Ashariya Baok,	60	50	..	..	..	5	..	2000	15	750	10	10	..	..	1000	3900
2nd, year

Explaining the manner in which the cultivated lands of the District of Patna city and Behar are occupied.—(Contd.)

Division or Thanah.

	Patna city.	Phatua.	Noubutpur.	Bakipur-Jaywar.	Sherpur.	Nawada.	Gaya.	Sheykhpurah.	Durijapur.	Bar.	Bohar.	Helsa.	Holasegunj.	Jahanabad.	Daudnagar.	Arwal.	Vikram.	Total.
Ginger	20	240	...	...	...	...	...	...	...	...	...	...	260
Turmeric	40	20	...	...	...	...	...	...	...	...	...	...	60
Peaj or Onions	250	30	25	80	10	200	40	40	10	40	20	100	50	100	75	50	40	1160
Garlic	...	10	25	...	...	20	10	...	10	40	20	40	20	50	...	...	20	265
Dhaniya by itself	200	...	40	40	...	20	...	...	...	...	...	...	300
Methi by itself	20	...	50	...	...	20	...	...	...	...	...	...	90
Jira	200	3300	...	...	...	...	...	...	...	...	...	4000
Saongp	20	...	...	...	...	...	...	...	...	...	...	20
Ajoyan by itself	40	...	...	20	...	...	...	...	...	...	60
Channani	10	...	...	...	...	...	...	10
Kicinus	13030
(Ghaungdiya)	...	50	350	...	...	5000	700	80	...	600	500	2800	350	2000	100	300	200	4250
Do. Chanaki	200	200	...	...	1100	100	...	...	250	500	100	1000	...	...	400	...
Do. mixed with
Safflower
Seeding Land by itself
Total	13	1160	650	300	205	8000	7050	6340	30	1600	6200	2250	2030	8600	2000	1500	1610	50118
	23500	228450	156320	149760	67200	1219200	1142400	560160	334080	259200	526030	600960	525000	462720	432000	343680	397440	7761480

TABLE NO. 17

Explaining the Cultivation of Grain, &c. in the Division of Patna City.

Kinds.	Number of double ploughings.	Number of hoeings.	Seed time.	Quantity of seed required for one bigah in sers.	Number of smoothings with the Chauki.	Number of weedings with the spud.	Number of waterings.	Harvest Season.	Average produce of one bigah in sers.	Average number of sers sold at harvest for one Rupee.	Number of bigahs cultivated in this manner.	Total produce in Mans and Sers.	Total value in Rypees and Annas.	Produce for consumption after deducting seed in Mans and Sers.
Fruit trees ...	...	...	...	...	...	...	...	...	...	...	3500	...	45500	...
Bamboos ...	...	...	...	...	...	...	...	...	...	...	2	...	20	...
Kitchen gardens ...	...	...	...	...	...	...	...	...	...	...	1000	...	20000	...
Vegetables in the fields ...	...	...	...	...	...	...	...	...	...	...	400	...	10000	...
Broadcast winter rice by itself ...	4	...	1 June	8	2	1	...	15 Nov.	200	60	200	1000	6 6 10	960
Broadcast winter rice followed by ...	4	...	1 June	8	2	1	...	15 Nov.	200	60	600	3000	2000	2880
Kheshari sown among the suitable ...	...	...	16 Sept.	8	...	...	...	1 Mar.	80	90	600	1200	533 5	1080
Broadcast winter rice followed by ...	4	...	1 June	8	2	1	...	15 Nov.	200	60	50	250	166 10	245
But sown among the suitable ...	...	...	16 Sept.	10	...	...	...	1 Mar.	80	70	100	100	57 2	87 20
Transplanted winter rice by itself ...	3 or 4	...	1 June	16	2	...	...	1 Dec.	240	60	100	600	400	560
Transplanted winter rice followed by ...	3 or 4	...	1 June	16	2	...	...	1 Dec.	240	60	200	1200	800	1123
Kheshari sown among the stubble ...	...	...	1 Oct.	8	...	...	...	1 Mar.	80	90	400	400	177 12	360
Broadcast Maruya mixed with Arabar ...	4	...	1 June	14	2	1	...	15 Aug.	120	70	20	60	34 4	59 15
...	...	...	...	1	...	...	...	1 April	120	60	...	60	40	59 20

Explaining the Cultivation of Grain, &c. in the Division of Patna City.—(Contd.)

Kinds.	Number of double ploughings.	Number of hoeings.	Seed time.	Quantity of seed required for one bigah in Sers.	Number of smoothings with the Chauki.	Number of weedings with the spud.	Number of waterings.	Harvest Season.	Average produce of one bigah in sers.	Average number of sers sold at harvest for one Rupee.	Number of bigahs cultivated in this manner.	Total produce in Mans and Sers.	Total value in Rupees and Annas.	Produce for consumption after deducting seed in Mans and Sers.
Broadcast Maruya mixed with Beans or Sem used green	4	...	1 June	1½	2	1	...	15 Aug.	120	70	20	60	34	59 15
Maize mixed with Kangni followed by Potatoes	4	1	1 June	2½	2	1	4 or 6	1 Nov.	240	80	20	100	50	100
Maize followed by Barley	6	2	1 Sept.	50	4	1	10	1 Aug.	320	80	75	6½	300	595 12½
Maize followed by Barley	4	...	1 Oct.	15	2	1	4 or 6	1 Jan.	1600	50	...	112 20	90	111 22½
Maize followed by Wheat	4	1	1 May	2½	2	1	4 or 6	1 July	320	80	200	1600	800	2906 10
Maize followed by Turi	6	1	1 Oct.	20	2	1	8	1 March	200	60	...	1000	666 10	1587 20
Maize followed by Maize	4	1	1 May	2½	2	1	4 or 6	1 July	320	80	200	1600	800	925
Maize followed by Maize	4	1	1 Oct.	1	1	...	2 or 3	1 Jan.	120	35	50	400	1000	1587 20
Maize followed by Maize	4	1	1 May	2½	2	1	4 or 6	1 July	320	80	...	150	171	396 35
Poppy mixed with Safflower	6	...	16 Sept.	2½	4	4	12 or 14	15 Jan.	80	74	400	3200	1600	3175
Maize followed by Poppy mixed with	4	1	1 May	2½	2	1	4 or 6	15 Feb.	30	6	...	40	3413	900
Maize followed by Poppy mixed with	6	...	16 Sept.	2½	4	4	12 or 14	25 Jan.	80	30	400	800	1066 10	775
Maize followed by Poppy mixed with	4	1	1 May	2½	2	1	4 or 6	10 Feb.	30	70	...	30	200	30
Maize followed by Poppy mixed with	6	...	16 Sept.	2½	4	4	12 or 14	15 Jan.	320	80	200	1800	171	285
Safflower and Garlic or Rasun	6	...	16 Sept.	1	2	4	10 or 14	5 Feb.	80	30	200	400	533	387 20
				5	...	...	...	15 Jan.	3	6	...	15	100	15
					...	...	...	5 Feb.	20	70	...	150	35	147 20
					...	...	...	1 March	40	60	...	200	133	175

Kinds.	Number of double ploughings.	Number of hoeings.	Seed time.	Quantity of seed required for one bigah in sers.	Number of smoothings with the Chukri.	Number of weedings with the spud.	Number of waterings.	Harvest Season.	Average produce of one bigah in sers.	Average number of sers sold at harvest for one Rupee.	Number of bigahs cultivated in this manner.	Total produce in Mans and Sers.	Total value in Rupees and Annas.	Produce for consumption after deducting seed in Mans and Sers.
Maize followed by Potatoes	4	1	1 May 1 Oct.	2½	2	1	4 or 6	1 July 20 Jan.	320 1800	50 70	800	6400 36000	3200 18000	6350 38000
Maize followed by Potatoes followed by Torai	4	2	1 May 15 Sept.	30	2	1	4 or 6	1 July 1 Jan.	320 1800	80 80	400	3200 15000	1600 9000	3175 17500
Maize followed by Potatoes followed by Karela mixed with Popchi or Kachu	4 or 6	1	1 May 15 Sept.	24	2	1	4 or 6	1 July 1 Jan.	400 1800	2000 100	500	4000 23500	8000 11250	4000 21875
Maize followed by Potatoes followed by Karela mixed with Popchi or Kachu and Oil	2 or 3	1	1 May 15 Sept.	40	1	1	30	15 April 1 Sept.	1600 400	100 100	500	20000 10000	2000 800	2000 4500
Maize followed by Potatoes followed by Karela mixed with Popchi or Kachu and Oil	4 or 6	1	1 May 15 Sept.	50	2	1	4 or 5	1 July 1 Jan.	320 150	80 80	200	1000 9000	800 4500	1587 8750
Maize followed by Potatoes followed by Karela mixed with Popchi or Kachu and Oil	2 or 3	1	1 Jan. 1 Mar.	40	1	1	30	15 April 1 Sept.	1600 400	80 100	200	8000 1000	4000 666	8000 900
Maize followed by Salgam or Turnip and Mathi	4	1	1 May 20 Aug.	2½	2	1	4 or 5	1 Aug. 1 Oct.	320 600	50 50	50	400 750	200 600	196 750
Kodo mixed with Arhar	3	1	1 June	2	1	1	8 or 10	2 Sept.	200	40	50	250	250	250
Wheat by itself	4	1	1 Oct.	20	2	1	...	1 April 1 March	160 240	70 40	40	160 360	91 360	158 330
Wheat mixed with But	4	1	1 Oct.	13½	2	1	...	1 Mar.	240	60	20	120	80	110

Explaining the Cultivation of Grain, &c. in the Division of Patna City.—(Contd.)

Kinds.	Number of double ploughings.	Number of hoeings.	Seed time.	Quantity of seed required for one bigah in sers.	Number of smootings with the Chanki.	Number of weedings with the spud.	Number of waterings.	Harvest Season.	Average produce of one bigah in sers.	Average number of sers sold at harvest for one Rupee.	Number of bigahs cultivated in this manner.	Total produce in Mans and Sers.	Total value in Rupees and Annas.	Produce for consumption after deducting seed in Mans and Sers.
Wheat mixed with Barley	...	4	1 Oct.	13½	2	...	...	1 March	240	60	10	60	40	55
Barley by itself	...	4	1 Oct.	6½	2	...	...	1 March	200	60	10	750	500	693
Barley mixed with Pease	...	4	1 Oct.	15	1 or 2	...	...	1 March	240	70	50	300	171	281
Barley mixed with But	...	4	1 Oct.	10	1 or 2	...	...	1 March	240	60	20	120	80	112
Masur by itself	...	2 or 3	1 Oct.	6	1	...	...	11 Feb.	160	70	20	80	45	77
Masur mixed with Linseed	...	2 or 3	1 Oct.	6	1	...	...	11 Feb.	180	70	10	40	22	13
Pease Yasuriya by themselves	...	2 or 3	1 Oct.	12	1	...	...	11 Feb.	160	80	100	400	200	370
Kabali pease by themselves	...	2 or 3	1 Oct.	10	1	...	...	11 Feb.	200	70	100	500	285	475
But by itself	...	2 or 3	1 Oct.	12	1	...	...	1 Mar.	160	70	100	400	228	370
But mixed with Linseed	...	2 or 3	1 Oct.	12	1	...	...	1 Mar.	160	70	50	200	114	185
Turi by itself	...	4	1 Oct.	1	2	...	...	1 Mar.	20	15	50	25	22	3
Rayi sown in the mud without culture	1 Oct.	1	...	...	...	1 Jan.	160	35	50	200	228	198
Poppy mixed with Safflower	...	6 or 8	15 Sept.	14	...	...	...	1 Feb.	120	40	100	300	300	296
	16 Sept.	2½	...	...	...	15 Jan.	5	7½	100	20	1706	20
	...	1	15 Sept.	1	2	4	10 or 14	5 Feb.	80	30	160	320	426	310
	15 Jan.	4	6	...	16	108	10
	10 Feb.	50	70	...	200	114	196

TABLE No. 34

General Abstract of the value and produce of lands occupied by farmers who cultivate with the plough in the District of Patna City and Zila Behar.

DIVISION OR THANAH.	Fruit trees value of	Fruit in Rupees	Bamboos value cut	Vegetables, &c. in gardens and fields value in Rupees.	Rice				China Kangni Sava Maruya Maize Kodo Jenera, &c.				Wheat and Barley				Pulse					
					Quantity of Mans.		Value in Rupees.		Remaining for consumption after deducting seed.		Quantity of Mans.		Value in Rupees.		Remaining for consumption after deducting seed.		Quantity of Mans.		Value in Rupees.		Remaining for consumption after deducting seed.	
Patna City	45500	86200	20	116419	6050	4033	5765	24992	12549	24676	3710	2898	3395	3500	1785	3221	374272	142012	402982	210724	374272	142012
Phattha	17500	7200	60	11361	383250	199977	360759	82955	43680	81397	151370	89884	142012	402982	210724	374272	202005	119808	210205	119808	202005	
Nouabpur	7200	1500	150	6293	346450	183328	325430	120152	56153	108066	124100	68294	115755	210205	119808	202005	225260	117639	244200	125874	225260	
Bakipur-Jaywar	10000	15000	15	7149	385030	230683	366683	87975	38365	86686	124707	78449	117639	244200	125874	225260	69920	41758	73802	35867	69920	
Shepur	6000	2000	20	3313	299840	140873	288737	31775	14914	31494	44550	35166	41758	73802	35867	69920						
Total ...	86200	144538	265	144538	1419720	758895	1347375	347850	165613	332320	448437	274692	420559	934670	494064	874680						
Gaya ...	7200	30	30	70660	4994025	2660538	4732835	347080	157964	343415	530687	390767	490932	1034525	571502	965115						
Nawada	70000	30	30	24560	4482600	1793040	4216637	101382	42295	91773	551550	342771	498455	1020147	534640	909475						
Sheykhpurah	50000	30	30	40241	2960512	1266596	2774375	230757	120817	228120	432700	266783	398252	556512	267440	509181						
Duriyapur	50400	40	40	10833	40120	20060	378.4	15577	86725	153829	545600	392533	489760	429215	235643	387520						
Bar ...	24300	150	150	10148	422202	210034	396269	...	116076	153829	351500	233921	323560	...	185553	...						
Behar	49200	200	200	9628	2481200	1101866	2387900	131950	52683	130586	471800	268825	407630	653050	294327	604175						
Helsa	93500	80	80	15695	2296400	1143550	2183437	164245	79401	161984	436500	287049	480705	759505	337330	708671						
Holasgunj	47500	60	60	9858	2124512	1062256	2840382	106792	53702	103390	419250	310393	388555	893462	409656	811197						
Jahanabad	43200	800	800	9691	1774825	788588	1679370	169895	80305	167672	231200	141928	211700	183450	100166	167331						
Daudnagar	28500	30	30	11813	1080825	614337	1017955	81775	37947	81021	534772	441514	515660	598862	329759	548565						
Arwal	10000	21	21	5528	1178625	670731	1120552	159562	67186	157332	213075	144417	199062	350639	191164	314718						
Vikram	20800	120	120	8581	1000375	547047	950950	227315	110107	185041	361475	229191	392795	457960	250943	422486						
Total	559400	1591	227213	24835522	11878647	23538739	2083366	1007211	2011674	5080110	3450099	664438	7252545	3708129	6665322	7540002						
	645600	1856	371769	26255242	12637543	24876114	2431216	1172825	2343994	5528547	3724791	5084997	8187215	4202189	7540002							

General Abstract of the value and produce of lands occupied by farmers who cultivate with the plough in the District of Patna City and Zila Behar. (Concluded).

Division or Thanah.	Grain.			Sugarcane.		Plants for making thread and rope				Plants for smok- ing & chewing.		Opium.				Plants used for dyeing.		Ricinus.			Total value of each Thanah.
	Quantity of Mans.	Value in Rupees	For consump- tion after de- ducting seed.	Quantity Mans.	Value in Rupees	Pata & San.	Cotton.	Betle.	Tobacco.	Quantity of Mans.	Value in Rupees.	Quantity of Mans.	Value of Mans.	Quantity of Mans.	Value in Rupees.	Quantity of Mans.	Value in Rupees.	Quantity of Mans.	Value in Rupees.	Remaining for consumption deducting seed.	
Patna City	680	726	672	85	7253	65	433	194152
Phatua	20459	20365	20043	101 165	37	3178	78	568	598880
Nounpur	19473	18007	18961	3200	4266	80	6300	16391	...	...	...	...	...	473	49426	420	2423	122	1748	537060
Bakipur-	18237	21230	18002	...	...	150 200	1500	4000	...	...	...	...	...	430	36746	412	430	2870	664	567117
Jaywar	8336	8254	8215	300	342	25 50	55	146	...	...	...	...	...	23	1910	32	162	30	29	247865
Sherpur	67186	39580	65895	3500	4608	336 495	7940	20750	1050	89515	1145	1026	6458	2615	2403	2145076
Gaya	44325	39322	43519	23790	27188	2410 3229	17000	43833	3000	40	80	127	10200	240	1603	15000	13333	14750	13089	4068903	
Nawada	135662	144288	133262	33450	35942	...	7330	20155	10000	...	...	157	12250	83	198	1324	2250	2070	2070	3087125
Sheykhpurah	135175	118893	13175	10050	13399	35 70	1930	5933	3000	67	270	226	19360	49	211	1692	670	659	659	2179958	
Duriyaspur	51943	47201	50878	...	...	...	3952	11871	...	380	950	1	120	407	2	16	3863	3863	3788	860899
Bar	23590	26769	23176	2247	2796	...	2898	8386	3000	...	...	63	5516	6150	92	779	2525	2525	2460	838182
Behar	36762	34052	36063	85530	97748	224 360	6300	18916	4000	...	...	292	25393	52	595	4760	1875	1500	1500	197667
Helsa	42200	41904	41350	23750	27142	...	2350	5875	...	...	...	273	21900	2479	353	2624	9425	9210	9210	2075086
Holaagunj	47600	57490	48433	23400	31199	...	175	466	...	70	140	73	5870	76	16	108	1320	1320	1302	1991438	
Jahanaabad	29598	29392	28843	23750	24164	...	675	1928	...	225	750	677	57424	35	144	960	10250	10100	10100	1301768	
Daudnagar	61375	66254	66254	1150	1583	...	4950	14142	...	...	...	154	12300	300	300	2500	350	350	345	1565761
Arwal	40387	46213	39897	262	349	...	1185	3266	...	100	383	449	37920	...	706	4706	600	600	581	1193011	
Vikram	47675	51589	46980	31200	41599	...	2280	6033	...	200	533	470	37600	5324	570	3039	1800	1800	1785	1327691	
Total	702846	707396	689848	288779	303366	2670 3659	55025	141014	23000	1082	3056	2963	244054	14660	3430	24114	49938	47897	48857	22416505	
	769832	775990	755744	2622279	307975	2946 4154	62905	161764	23000	1082	3056	4013	333569	15806	4456	30573	52603	50300	50421	24561581	

TABLE NO. 36.
 Estimate of the Live Stock in Patna City and Zila Behar—(under each Thanah.)

	Patna city		Phatuha.		Noubutpur.		Bakipur-Jaywar.		Sherpur.		Gaya.		Nawada.		Sheykhpurah		Durlapur	
	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value
Bulls reserved for breeding ...	30	...	125	...	125	...	165	...	40	...	1500	...	200	...	1000	...	100	...
Do. wrought in the plough belonging to the high castes ...	100	500	2200	13200	1800	9000	300	1500	710	3550	23400	128375	4630	30095	2388	14328	100	400
Oxen used in wheel carriages for passengers alone ...	160	3200	...	...	...	...	40	640	2	30	24	528	2	30	...	...	...	...
Oxen used in carts for carrying passengers or goods ...	400	6400	20	350	...	...	60	900	6	72	100	1700	18	225	...	...	50	650
Oxen used for carrying back loads belonging to traders ...	2000	35000	4000	70000	200	300	500	6230	250	2750	6000	75000	5000	62500	5000	80000	260	2990
Oxen used for carrying back loads belonging to farmers ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	40	460
Oxen used both in the plough and for carrying loads or to draw carts ...	...	...	2000	16750	3600	31500	...	...	600	3960	...	...	...	...	200	1000	...	...
Oxen used in machinery ...	1000	5500	500	2500	80	320	200	1000	60	240	1200	6000	175	7374	500	2000	200	900

APPENDICES

Estimate of the Live Stock in Patna City and Zila Behar—(under each Thanah.)(Continuation of Table No. 36.)

	Patna city		Phatua.		Noubutpur		Bakipur-Jaywar.		Sherpur.		Gaya.		Nawada.		Sheykhpurah.		Duriyapur.	
	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value	No. of cattle	Total value
Oxen used in the plough alone belonging to the high castes ...	150	1200	12450	99600	7350	64312½	8700	21350	2350	14100	92150	598975	53830	349895	74440	516427½	29220	171687½
Oxen used in the plough belonging to tradesmen	...	...	520	4290	740	6475	757	8327	1000	6000	10680	69420	6730	43745	7850	54950	2920	19710
Oxen used in the plough belonging to mere farmers	2750	22000	18250	141437½	15490	135012½	13800	144900	6835	40110	61700	401050	83000	539300	68170	545360	14610	87660
Buffaloes used in the plough	...	...	200	1000	...	...	50	200	...	...	1200	5400	1200	7200	2500	11250	...	...
Milch Buffaloes	1000	14000	1400	19600	500	6750	1000	16000	200	1800	3000	39000	2000	28000	3000	42000	10000	175000
Cows belonging to high castes	900	6750	2720	20400	2520	11025	2080	11440	976	4392	45423	295249½	59550	327525	24090	132495	17610	88050
Cows belonging to tradesmen	1300	9750	1025	7687½	420	1890	4854	26719	250	11125	32450	178475	32750	180125	18460	101530	1980	9900
Cows belonging to farmers	600	4500	18000	135000	3800	17100	4162	22891	2680	12060	129780	778680	99220	540210	53780	295790	8900	44500
Goats grown females	2000	1000	1900	950	1000	500	1450	725	750	375	7000	3500	4000	4000	4000	2000	1700	850
Sheep called Garar breeding females	1100	687½	1000	550	200	125	1500	1125	100	62½	1500	937½	875	875	1700	850	800	600
Swine total	800	500	1000	1250	400	251	1500	750	700	350	15000	7500	4000	4000	2000	1000	2000	1000
Asses	350	1050	40	120	5	15	50	125	25	75	100	300	20	20	150	337½	10	25

Estimate of the Live Stock in Patna City and Zila Behar—(under each Thanah.)—(Contd.)

	Bar.		Behar.		Helsa		Holasgunj.		Jahanabad.		Daudnagar.		Arwal.		Vikram.		Total.	
	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.	No. of cattle.	Total Value.
Bulls reserved for breeding ...	100	...	300	...	730	...	200	...	100	...	350	...	40	...	30	...	5125	...
Do. wrought in the plough, belonging to the high castes ...	1000	5500	2140	11770	1100	4400	2100	14700	7200	39600	3500	17500	5600	33600	1600	10400	59968	333418
Oxen used in wheel carriages for passengers alone ...	10	220	4	60	20	470	2	50	...	...	8	160	...	...	...	...	272	5388
Oxen used in carts for carrying passengers or goods ...	100	1250	16	240	30	300	8	140	...	...	200	3500	20	250	50	700	1078	16677
Oxen used for carrying back loads belonging to traders ...	2000	25000	10000	0000	4000	56000	1000	15000	2500	28750	1500	22500	500	6250	800	11200	45510	652190
Oxen used for carrying back loads belonging to farmers ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	40	460
Oxen used both in the plough and for carrying loads or to draw carts ...	2260	22600	1000	10000	100	750	...	...	2025	12150	...	...	1200	9000	300	3225	13345	110935
Oxen used in machinery	300	1350	600	1800	200	700	300	1200	200	900	500	2000	125	625	200	1200	6340	290224

APPENDICES

Estimate of the Live Stock in Patna City and Zila Behar—(under each Thanah.)—(Contd.)

	Bar.		Behar.		Helsa.		Holasingj.		Jahanabad.		Daudnagar.		Arwal.		Vikram.		Total.	
	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.	No. of cattle.	Total value.
Do. used in the plough alone belonging to the high castes ...	14825	118600	24840	203377½	25940	152397½	24930	174510	32400	240975	17200	89225	14700	110250	26400	128700	461875	3125562½
Oxen used in the plough belonging to tradesmen ...	1580	12640	4150	33200	2410	14460	2100	14700	2025	12150	2950	23600	1350	10125	1900	14012½	49662	347804½
Oxen used in the plough belonging to merefarmers.	17480	139840	37325	298600	47160	277065	39470	276290	28340	177125	32300	250325	22000	165000	21875	164062½	530345	3805337½
Buffaloes used in the plough ...	400	2400	4000	18000	200	1100	1000	5500	600	3300	100	450	50	225	200	1200	11700	57225
Milch Buffaloes.	1000	13000	10000	140000	200	2600	500	6500	3000	36000	1200	10200	1000	13500	700	9800	39700	573750
Cows belonging to high castes...	10480	68120	3500	20125	3040	10640	4430	31010	17900	71600	6540	32700	4000	24000	6600	33000	212359	1188521½
Cows belonging to tradesmen ...	2100	13650	10520	61805	860	3010	940	6580	1800	7200	4360	21800	1000	6000	1650	8250	116723	645496½
Cows belonging to farmers ...	18100	117650	14020	80615	44850	156975	18260	127820	16110	64440	23990	119950	11100	66600	9400	47000	475752	2631781
Goats grown females ...	2100	1050	10000	5000	1000	500	6500	3250	4000	2000	5500	2750	3800	1900	1750	875	58450	29225
Sheep called Garar breeding females ...	1000	500	4700	2937½	600	225	500	187½	2000	750	1000	375	4500	1687½	4400	2200	27475	14187½
Swine total ...	1500	1125	5000	1875	2000	1250	800	400	4000	2500	4000	2500	500	375	700	700	45900	26075
Asses ...	50	125	...	...	50	125	...	...	10	30	...	...	...	...	...	...	860	2377½
																	2162479	13595434

TABLE NO. 37.

Estimate of the quantity of Milk procured by the owners of cattle in the District of Patna city and Zila Behar.

Division or Thanah.	Cows.						Buffaloes.						Total.	
	Total number.	Number giving milk.	Average yearly produce of each cow in Sers.	Total milk in Mans & Sers.	Price of the milk in Sers.	Total value of milk in Rupees and Annas.	Total number.	Number giving milk.	Average yearly produce of each buffalo in Sers.	Total milk in Mans & Sers.	Price of the milk in Sers.	Total value of milk in Rupees and Annas.	Total milk in Mans & Sers.	Total value of milk in Rupees and Annas.
Patna city	2800	140	200	7000	33	848413	1000	500	400	5000	33	6060	12000	14545
Phatuba	21745	10872	200	54360	45	48320	1400	700	400	7000	45	6222	61860	54542
Nounbutpur	6740	3370	150	12637	60	8425	500	250	430	2897	20	2150	15325	10575
Bakipur-Jaywar	11100	5550	150	20812	40	20812	1000	500	400	5000	40	5000	25812	25812
Sherpur	3900	1953	150	73287	30	6314	200	100	280	700	45	622	73987	7136
Gaya	46291	23145	850	168097	10	92555	4100	2050	1910	20387	20	20035	188484	112610
Nawada	207653	103526	144	373773	24	319102	2	1500	468	17550	45	15600	391323	333702
Sheykhpurah	190520	95260	115	273872	20	251765	2000	1000	346	8650	45	7688	282522	262453
Duriyapur	28490	14215	126	251715	52	193646	3000	1500	300	11250	50	9000	262965	202646
Bar	30680	15340	145	51637	24	84347	2000	1000	285	7125	33	8636	58762	92984
Behar	28040	14020	270	103590	36	115022	3	1000	440	5500	36	6111	109020	121133
Helsa	48750	24375	195	117619	15	44864	10000	5000	320	40000	40	40000	96080	84864
Holasgunj	23630	11815	130	38398	45	140550	3	200	420	1050	45	933	118669	141483
Jahanabad	35810	17905	140	62667	45	34132	500	250	236	1475	32	1843	123987	359751
Daudnagar	34890	17445	170	74141	40	55704	3000	1500	405	15187	20	18994	77854	74688
Arwal	16100	8050	190	38287	35	43700	1200	600	255	3825	40	3825	77966	77966
Vikram	17650	8825	280	61775	50	4942	700	350	550	3125	35	3600	41362	47900
										4812	20	3850	66587	59270
	758543	379271	2065	1503435	39	1408394	7	13800	4275	119550	...	120073	31622985	1528467
Total	804834	402416	2915	1671533	9	1509950	4	15550	6185	139937	20	140126	31811470	1641078

TABLE NO. 38

Estimate of the proportion of rent paid in the district of Behar and city of Patna by the high casts, dealers, artificers, and ploughmen; and of the proportion of the ploughs held by their owners or men of their families, by those who cultivate for a share, or by hired servants or slaves, &c.

Proportions of Rent.	Division or Thanah.																
	Patna city.	Phatua.	Noubutpur.	Bakipur.	Sherpur.	Gaya.	Nawada.	Sheykh- purah.	Duriyapur.	Bar.	Rohar.	Ilisa.	Holasgunj.	Jahanabad.	Daud- nagara.	Arwal.	Vikram.
Rent paid by high castes	2-64	24-64	22-64	20-64	20-6	36-64	28-64	32-64	38-64	28-64	20-64	9-64	24-64	28-64	16-64	14-64	28-64
Rent paid by merchants or shopkeepers	22-64	2-64	4-64	1-64	4-64	1-64	1-64	1-64	few	3-64	1-64	1-128	4-64	4-64	2-62	1-64	4-64
Rent paid by artificers	16-64	1-64	4-64	3-64	4-64	3-64	4-64	4-64	2-64	2-64	4-64	5-128	4-64	4-64	6-64	7-64	4-64
Rent paid by ploughmen	24-64	37-64	38-64	40-64	40-64	24-64	32-64	27-64	24-64	33-64	39-64	52-64	36-64	32-64	40-64	42-64	32-64
Ploughs held by persons who rent land and have stock	48-64	48-64	44-64	40-64	40-64	40-64	36-64	44-64	20-64	26-64	44-64	48-64	44-64	32-64	44-64	44-64	36-64
Ploughs held by persons who rent land but have no stock and are called Dhuriya	...	...	...	...	...	...	...	...	4-64	4-64	...	...	...	...	...	...	...
Ploughs held by servants or slaves	16-64	16-64	20-64	24-64	24-64	24-64	28-64	20-64	40-64	34-64	20-64	16-64	20-64	32-64	20-64	20-64	28-64
Proportion of rent farmed	4-64	2-64	32-64	16-64	6-64	52-64	8-64	32-64	2-64	48-64	12-64	16-64	48-64	36-64	56-64	24-64	16-64
Proportion of rent collec- ted by stewards	60-64	62-64	32-64	48-64	58-64	12-64	56-64	32-64	62-64	16-64	52-64	48-64	16-64	28-64	8-64	40-64	48-64
Proportion of rent paid in money	whole	56-64	24-64	8-64	24-64	4-64	8-64	8-64	36-64	32-64	48-64	16-64	16-64	8-64	16-64	4-64	4-64
Proportion of rent aris- ing from a division of crops	few	8-64	40-64	56-64	40-64	60-64	56-64	56-64	28-64	32-64	16-64	48-64	48-64	56-64	48-64	60-64	60-64

TABLE No. 40

An estimate of the farmers who pay their rent from their own stock; of those who borrow ready money for the purpose; of those who take advances for produce, but at the crop season are able to discharge their engagements; and of those who are yearly increasing their debts.

Classification of Farmers.	Division or Thanah.																	
	Patna city.	Phaluba.	Noubutpur.	Bakipur-Jaywar.	Shorpur.	Gaya.	Nawada.	Sheykhpurah.	Durjaypur.	Bar.	Behar.	Helsa.	Holagunj.	Jahanabad.	Daudnagar.	Arwal.	Vikram.	Total.
Farmers who pay their rent from their own stock	44-64	4-64	8-64	16-64	16-64	16-64	32-64	32-64	16-64	16-64	48-64	12-64	16-64	24-64	24-64	4-64	4-64	21-64
Farmers who borrow ready money to pay their rent	20-64	20-64	48-64	24-64	40-64	32-64	32-64	8-64	24-64	24-64	12-64	24-64	16-64	28-64	24-64	60-64	56-64	27-64
Farmers who take advances on their crop to enable them to pay their rent	—	40-64	8-64	24-64	8-64	16-64	—	24-64	24-64	24-64	4-64	—	8-64	12-64	16-64	few	4-64	12-64
Farmers who are annually increasing their debts	—	few	few	—	—	few	few	100	—	—	20	28-64	24-64	—	—	—	few	4-64
Farmers who take advances from their landlord to assist in cultivation	—	4-64	4-64	—	—	2-64	8-64	8-64	—	some	4-64	8-64	—	—	—	—	32-64	—

List of Artists in the city of Patna and district of Behar.—(Contd.)

Classification of Artists.	Division or Thanah.																	
	Patna city.	Phatuba.	Noubtupur.	Bakipur-Jaywar.	Sherpur.	Gaya	Nawada.	Sheykhpurah.	Duriyapur.	Bar.	Behar.	Helsa.	Holasgunj.	Jahanabad.	Daudnagar.	Arwal.	Vikram.	Total.
45 Morasaz	6	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	7
46 Paper maker	3	..	..	..	..	..	..	..	..	..	30	..	..	..	..	20	..	64
47 Mohuradar	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
48 Guddi maker	14	..	..	..	..	17	..	..	..	1	25	..	..	..	..	..	..	57
49 Atushbaz or preparer of fire works	29	3	..	1	2	12	5	5	1	2	20	5	2	10	15	1	5	118
50 Book binder	12	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	15
51 Chik who tan sheep and goat skins	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
52 Kimokhtsaz who prepare leather from ass and horse skins	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
53 Dabgar leathern bag or target maker	7	..	..	..	..	7	5	..	..	..	4	..	..	..	9	..	..	32
54 Chamar tanners and shoe makers	336	150	50	150	100	203	300	175	135	150	253	400	200	25	400	60	150	3462
55 Chikundoaz make a kind of shoes called Chikun black cloth embroidered with coloured silk	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
56 Zurdoz make the embroidered part of the fine shoes	37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
57 Kufsoz join the embroidered part to the leather in fine shoes	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6

APPENDICES

List of Artists in the city of Patna and district of Behar.—(Contd.)

[illegible]

Classification of Artists.	Division or Thanah.												Total.					
	Patna city.	Phatua	Noubutpur.	Bakipur-Jaywar.	Sherpur.	Gaya.	Nawada.	Sheykhpurh.	Duriyapur.	Bar.	Behar.	Helea.		Holasgunj.	Jahanabad.	Daudnagar.	Arwal.	Vikram.
78 Bharbuna waleh	300	80	40	80	50	156	150	100	100	200	150	80	50	50	100	60	150	11896
79 Khasiyawala	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
80 Kuntilayi	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
81 Flour grinders	45	...	...	20	...	15	...	...	...	...	...	...	...	...	...	...	...	80
82 Daldara	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5
83 Nanwais	51	...	...	9	...	2	...	...	...	...	10	1	...	...	3	...	...	76
84 Phaludawaleh	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
85 Bukrussabs or butchers	172	12	1	15	4	25	...	20	3	3	100	5	2	25	20	4	...	411
86 Kusabs	64	5	5	11	6	12	5	...	...	...	50	50	8	...	50	1	4	271
87 Bawarchis or cooks	20	...	...	20	...	...	...	...	...	...	...	...	...	...	...	...	...	40
88 Khundigur or workers in horn and ivory	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
89 Kangshaigur or hair comb maker	7	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	8
90 Turners	26	2	...	...	...	3	...	...	...	...	5	...	1	...	...	...	...	37
91 Khadimbund make the frames of looking glasses	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
92 House and planquin painter	15	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	20
93 Saws	84	2	2	15	...	10	...	...	...	...	...	...	...	...	2	...	2	117
94 Beldar or cleavers of wood	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	73
95 Barhai, those who make coarse wooden furniture and implements of agriculture	441	75	30	162	20	500	200	300	...	50	500	...	200	300	150	50	150	3128

Classification of Artists.	Division or Thanah.																	
	Palua city.	Phatuba.	Noubutpur.	Bakipur-Jaywar.	Shepur.	Gay.	Nawada.	Sheykhpurah.	Duriyapur.	Bar.	Bohar.	Helsa.	Holasingunj.	Jahanabad.	Daudnagar.	Arwal.	Vikram.	Total.
115 Sonkari, who clean gold and silver	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
116 Jelahgur, who polish gold and silver	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
1117 Tarkush makers of coarse wire	24	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	25
1118 Taniya or makers of fine wire	7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
1119 Chapriya wire flatteners	64	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	64
1120 Tubakgur makers of gold and silver leaf	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
121 Mulumbasaz or gildar	16	..	..	..	..	1	10	..	..	..	1	..	..	..	..	..	..	28
122 Hukkah	41	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	84
123 Stone cutters	350	100	30	135	50	500	100	200	200	10	400	75	200	200	300	50	60	2900
124 Potters ... ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
125 Potters who make (Khelonas) toys	30	..	..	..	..	10	..	..	..	2	5	..	2	..	..	..	..	49
126 Pajaya	3	..	..	8	..	3	..	..	..	..	..	..	..	..	..	..	..	14
127 Brick-makers	47	..	..	120	..	25	..	..	..	..	100	15	..	..	..	..	..	192
128 Bricklayers	600	..	..	75	..	200	..	..	..	..	100	..	..	..	..	..	..	990
129 Lime burners	14	..	..	..	..	5	10	..	..	..	5	10	14	..	8	..	..	66
130 Dhuniya or cotton cleaners	278	100	25	70	60	100	100	125	50	45	200	100	50	70	400	50	50	1873
131 Spinners of cotton	23400	17622	8320	6238	3020	33885	9270	63265	9041	6059	35632	32775	7261	31710	16060	11220	13565	330396
132 Dyers or Rungrez	156	15	4	35	4	40	15	12	8	20	25	50	15	25	100	8	20	552

TABLE NO. 43.

Estimate explanatory of the manufacture of finer cotton cloth in the Company's factories of Maghra, Jahanabad, and Bigha.

Factory.	Kind of cloth.	No. of pieces which loom weaves in a month.	Size of the pieces.	Number of threads in the warp.	Value of a piece.		Thread required for warp in one piece in Sica weight.	Cost of the warp.		Thread required for wool in S. W.	Cost of the wool.		Total thread in S. W.		Total value of thread required to one piece.	Starch and soap.	Total charges.	Profit by one piece.		Total profit in a month for each loom.	
					R.	A.		R.	A.		R.	A.	R.	A.							
Arrang Maghra.	Amriti naya rasi . .	2	36 by 1 10-16	1050	3	12	85	1	5	95	1 5½	1 5½	180	2	2 10½	..	..	1	1½	2 3
	Amriti rasi . .	3	37 by 1½	1000	2	10	60	0	14½	70	1 0	1 0	130	2	2 14½	..	..	0	11½	1 13
	Amriti rasi . .	2	36 by 2	1125	4	4	110	1	7½	120	1 8	1 8	230	2	2 15½	..	..	1	0½	2 3
	Tangzeb . .	2	36 by 2	1300	5	4	65	2	3	75	1 13	1 13	110	4	4 0	..	..	1	4	2 3
	Mamal . .	2	36 by 2	1200	5	0	50	2	2	30	1 8	1 8	80	3	3 8	..	..	1	8	2 3
Arrang Bigha.	Mahamudi maddham .	3	27 by 1 10-16	1200	3	6	55	1	3½	65	1	1	120	2	2 8½	..	..	0	13½	2 8½
	Mehi mahamudi naya	—	27 by 2	2000	7	12	80	2	11½	80	3	3	160	5	5 14½	..	..	1	13½	..
	Salgachhi . .	—	27 by 2	1750	5	8	90	2	0	100	2 0	2 0	190	4	4 0	..	..	1	5	..
	Mehi mahamudi . .	—	27 by 1 10-16	1500	4	4	80	1	9½	80	1 9½	1 9½	160	3	3 0½	..	..	1	4½	..
	Amriti naya mehi . .	—	36 by 1 10-16	1200	4	5	120	1	9½	130	1 8	1 8	250	3	3 1	..	..	1	5	..
Arrang Jahanabad.	Baffa mehi . .	—	36 by 1½	1200	4	6	110	1	9	120	1 8	1 8	230	3	2 1½	..	..	0	10½	..
	Mahamudi rasi . .	—	27 by 1 10-16	950	2	12	100	1	0½	110	1 3½	1 3½	210	2	2 10	..	..	0	10	..
	Baffa chhita . .	—	25 by 2	1150	3	4	100	1	5½	115	1 4½	1 4½	215	2	2 10	anas	0	10	..
	Mahamudi naya mehi	1	40 by 2	1900	11	0	120	4	1	130	4 4½	4 4½	250	8	8 6½	..	8	2	8	2 8	
	Kanikos mehi . .	1	48 by 2	1600	9	12	200	3	1½	240	3 12	3 12	440	7	7 10½	..	12	0	13	2 0	
Arrang Jahanabad.	Rasi Baffa . .	2	36 by 2	1100	4	8	170	1	9½	190	1 10	1 10	360	3	3 3½	..	3	1	0	2 0	
	Gara . .	2	36 by 2½	1100	4	8	190	1	12½	210	1 13	1 13	400	3	3 6½	..	3	1	0	2 0	
	Amriti naya mehi . .	2	36 by 1 10-16	1050	3	13	140	1	5	160	1 6	1 6	300	2	2 11	..	12	1	1	2 2	
	Naya baffa . .	3	27 by 2	1325	3	14	120	1	6½	140	1 7	1 7	260	2	2 14	..	15½	1	14	2 12½	
	Kanikos behar . .	1½	40 by 2	1125	4	6	180	2	4	220	2 6½	2 6½	400	4	4 10½	..	12	1	10	2 7	

TABLE NO. 44.

Exports and Imports of the district of Patna City and Zila Behar.

Articles of Commerce.	Patna City.		Total of Patna City and all the other Divisions	
	Exports	Imports.	Exports	Imports.
	Rupees.	Rupees.	Rupees.	Rupees.
Rice in the husk ...	10000	182300	74500	184300
Rice cleaned by boiling ...	49000	305000	221900	307300
Rice cleaned without boiling ...	139100	34000	222900	38200
Kodo ...	—	2900	1500	3800
Maruya ...	—	42300	250	42900
Kauni ...	—	700	—	700
Wheat ...	183200	470000	207950	495700
Barley ...	18000	44000	24400	47600
Maize ...	25800	91800	28650	95850
Janera ...	22000	80700	26700	81400
Bajra ...	2900	500	2900	500
China ...	—	2000	—	2000
Sama ...	—	70	—	70
Jaokerao or mixture of barley and pease ...	8600	64800	17300	66500
But ...	65300	106000	93450	112100
Bhetmash ...	—	60	—	60
Arahar ...	38300	162600	54400	162600
Pease ...	24500	21800	38950	21800
Bhringgi ...	100	8300	100	8325
Mung ...	2100	4700	2100	4900
Urid or Mashkalai ...	1600	69700	1950	70780
Khesari ...	23900	47100	47450	47100
Masur ...	34100	42300	43100	42300
Kulthi ...	400	37200	1900	37200
Rape and mustard seed ...	800	77300	9100	78850
Seed of Sisamum or Til ...	—	23900	800	24400
Poppy seed ...	2600	58300	2725	58300
Linseed ...	2300	193900	8850	195100
Linseed and Mustard ...	—	125000	—	125000
Ricinus ...	—	9500	2250	10000
Oil ...	3200	120000	3700	124000
Ghiu or boiled butter ...	71600	184250	80480	207750
Milk ...	—	10000	—	10000
Salambi Salt ...	—	143750	—	150150
Coast salt or Karkach and Saphri ...	260000	337500	260000	356500
Bengal salt or Pangga ...	539100	1297000	552350	1394200
Sugar ...	94800	125000	101050	127800
Extract of Sugarcane ...	69700	64250	79915	71300
Treacle or Chhoya ...	—	3800	—	4450
Sukkur or coarse sugar ...	48000	26300	54000	26300
Bhura a kind of sugar ...	6600	16500	6600	165000
Honey ...	200	400	200	400
Betlenuts ...	25000	100250	25000	106525
Cocconuts and shells ...	3250	16500	3250	17450
Tobacco ...	—	152900	—	235275
Hempbuds or Gangja ...	5000	20000	5000	20500
Indigo ...	—	14000	92000	14000
Opium ...	549258	294366	549258	294366
Mahuya flowers ...	—	41800	1000	53500

Exports and Imports of the district of Patna City and Zila Behar.—(Contd.)

Articles of Commerce.	Patna City.		Total of Patna City and all the other Divisions	
	Exports	Imports.	Exports	Imports.
	Rupees.	Rupees.	Rupees.	Rupees.
Turmeric	15600	31250	16500	43845
Ginger	900	5800	900	6300
Betle leaf	—	13000	1300	14525
Safflower	2000	3000	2000	3000
Jira seeds	1600	—	16200	40
Pasari goods	74600	163000	74610	170700
Wax and candles	27000	40800	30750	44550
Catechu or Kath	45000	55000	45000	55550
Glass rings	—	—	—	106
Lac	4000	4700	4000	10125
Gulal	7000	—	7000	—
Gold	—	10000	—	10000
Copper	36250	58400	36250	58400
Zinc or Justah	52000	109250	52000	109250
Tin or Rangga	24000	44800	24000	45000
Lead	37900	50500	37900	50500
Iron	10500	16900	16800	48975
European iron and Pholad	100	800	100	800
Bindaloha or Murshedabad iron	—	750	—	750
Brass and bell metal vessels	10000	32000	17700	41425
Iron wares	—	1000	—	1000
Pata or hemp of Cochorus	3000	9200	3000	12050
Sack cloth bags and ropes	800	3500	800	4925
Kasmiri San or hemp of Crotonaria	900	4600	900	4670
Cotton wool	5000	130000	5000	133000
Cotton with the seed	—	—	9550	—
Cotton thread	1500	2000	3400	33900
Cotton cloth	200000	25000	545000	38500
Diaper or Table cloth	—	—	175000	—
Cocoons or Tasarguti	—	—	—	60500
Banusa cloth Tasar and cotton mixed	—	—	124000	600
Pure silk cloth	3500	10000	3500	10550
Raw silk	—	2000	—	2150
Maldehi masru and other cloth of silk and cotton mixed	12000	30000	12000	45800
Cotton and woollen sutrunjis	19000	2000	22000	2000
Chintz	121500	15000	123500	15400
Kharuya cloth	2000	5000	2000	6000
Blankets	2000	500	7800	2850
Gold and silver thread or lace	15000	—	15000	650
Shals	4000	15000	4000	15500
Perfume and essences	3100	5300	4000	5950
Leathern bags and Targets	—	1000	25	1000
Shoes	100000	—	100500	200
Manihari goods	47200	61100	47200	61435
Papers	—	2850	1125	5550
Wooden furniture	3000	3000	3000	3025
Timber of Sakuya and Sisau, &c.	—	24350	—	34250

Exports and Imports of the district of Patna City and Zila Behar.—(Contd.)

Articles of Commerce.	Patna City.		Total of Patna City and all the other Divisions	
	Exports	Imports.	Exports	Imports.
	Rupees.	Rupees.	Rupees.	Rupees.
Small posts, beams, planks, and bamboos	500	16500	500	36050
Fire wood	—	80000	—	81700
Charcoal	—	5000	—	6000
Bamboo baskets	—	—	—	2050
Nal Sap and Kus mats	—	4000	—	4000
Rattans	—	500	—	1500
Reeds or Nal	—	900	—	900
Reeds and grass	—	400	—	6900
Sabe and Muj	—	5100	—	6790
Sal leaves for plates	—	100	—	100
Dhuna	1600	1900	1600	1900
Venison and game	—	—	—	400
Fishes	—	7000	—	8500
Swine	—	500	—	800
Sheep and Goats	—	5000	650	6500
Buffaloes	—	—	—	500
Oxen and cows	—	600	—	40700
Leather of oxen and buffaloes	—	—	—	3000
Lime	—	32000	—	32900
Stone wares	—	2000	4000	2450
Soda Sajji and Rehe matti	2500	6750	2500	8800
Khari salt	3650	5700	3650	5700
Fowls	—	—	—	1500
Singing birds	—	200	—	200
Red lead	3800	11200	3800	20825
Vegetables for eating	3000	3200	3250	3200
Saltpetre	—	—	12600	—
Fresh fruit	1700	8200	1700	10500
Hot seasonings	4550	8850	4550	8850
Dried fruits	500	5200	500	5200
Ivory	—	500	—	500
Broad Cloth	8000	12000	8000	12000
Tush	2500	4000	2500	4000
Chaungri and Musk	5000	10000	5000	10000
Total	3259558	6510516	4599988	7145806

APPENDIX II.

LIST OF DRAWINGS.

- | | [Remarks] |
|--|---|
| 1. Stone mosque at Patna. | [Very badly reproduced in Martin's ed. p. 41] |
| 2. Image found in the river at Patna. | |
| 3. Image built into the gate leading to the stair on the banks of the Phalgu at Vishnupad in Gaya. | [No. 2 facing p. 57 in Martin's ed.] |
| 4. Image on the outside of the same gate towards the river. | |
| 5. Image of Gayeswari. | [No. 1 facing p. 57 in Martin's ed.] |
| 6. Image of Gadadhar in the great temple at Gaya. | [No. 3 facing p. 60 in Martin's ed.] |
| 7. Images in a Sannyasis convent near the temple of Gadadhar at Gaya. | [Nos. 1 & 2 facing p. 59 in Martin's ed.] |
| 8. Inscription on a stone in a convent of Sannyasis near Vishnupad. | |
| 9. Another inscription at the same place. | |
| 10. Inscription on an image built into the wall of the Dharmasala near Gadadhar temple at Gaya. | |
| 11. Inscription on a pillar in the temple of Gadadhar at Gaya. | |
| 12. Inscription on a pillar in the passage between Vishnupad and Gadadhar at Gaya. | |
| 13. Engraving and inscription on a stone beam in the same passage. | [No. 1 facing p. 60 in Martin's ed.] |
| 14. Image in the same passage. | [No. 1 facing p. 62 in Martin's ed.] |
| 15. Image on the stair descending from the temple of Gadadhar to the Phalgu. | [No. 3 facing p. 57 in Martin's ed.] |
| 16. Ground plan of the Vishnupad at Gaya. | |
| 17. Elevation of one of the buttresses in the Vishnupad. | [In Martin's ed., p. 63] |
| 18. Image placed in the temple of Vishnupad. | [No. 2 facing p. 62 in Martin's ed.] |
| 19. Inscription on an image of Ganese at Swaung [sic] Dewari near Vishnupad. | |

20. Inscription on a broken pillar lying near the Vishnupad.
21. Nine planets of the orthodox Hindus.
22. Images found in the convent of Sannyasis near Gadadhar at Gaya. [Nos. 3 & 4 facing p. 59 in Martin's ed.]
23. Representation of the 10 incarnations of Vishnu from the Vishnupad. [No. 3 facing p. 62 in Martin's ed.]
24. Asta Sakti from Kongch.
25. Image of Gorakshnath near the temple of Nrisingha adjacent to the Vishnupad at Gaya. [No. 6 facing p. 65 in Martin's ed.]
26. Inscription behind the lintel of the door of the temple of Nrisingha at Gaya near the Shorasabedi.
27. Inscription above the lintel of the same door.
28. Inscription on the roof of the same door behind the lintel.
29. Inscription at the left hand of the image in the temple of Nrisingha.
30. Inscription on the threshold of the temple of Gayeswari.
31. Inscription on the stair of the temple of Gadadhar.
32. Inscription in a small chamber north from the temple of Nrisingha near the Vishnupad at Gaya.
33. Inscription in an apartment within the above containing a Lingga.
34. Image in the Dharmasala near Shorasabedi at Gaya.
35. Image in the temple of Nrisingha at Gaya on the north side.
36. Image on the door of Nrisingha at Gaya. [No. 3 facing p. 65 in Martin's ed.]
37. Image called Kuber on the north side of the temple of Nrisingha at Gaya.
38. Image on the south side of the temple of Nrisingha at Gaya. [No. 2 facing p. 65 in Martin's ed.]
39. Image on the south side of the temple of Nrisingha at Gaya.
40. Image in the temple of Nrisingha at Gaya on the south side. [No. 1 facing p. 65 in Martin's ed.]
41. Image on the north side of the temple of Nrisingha at Gaya.
42. Image on the north side of the temple of Nrisingha at Gaya.

43. Image on the north west side of the temple of Nrisingha at Gaya.
44. Image in the Dharmasala near Shorasabedi at Gaya.
45. Image on the wall of the west side of the area of Vishnupada at Gaya. [No. 5 facing p. 65 in Martin's ed.]
46. Image on a broken stone on the south side of Vishnupad at Gaya.
47. Image on a platform near Vishnupad at Gaya. [No. 4 facing p. 65 in Martin's ed.]
48. Image on the south side of the temple of Vishnupad at Gaya.
49. Image on the south side of the area of the temple of Gadadhar at Gaya.
50. Image called Ramchandra east from Gadadhar. [No. 2 facing p. 60 in Martin's ed.]
51. Image on the outside of Gayeswari.
52. Inscription built into the wall of a temple of Siva at the Akshayabat.
53. Inscription at the temple of Janardan near Gaya.
54. Inscription on the temple of Pra-pitamaha near Gaya.
55. Image at the temple called Krishna Dwarika at Gaya.
56. Image at the temple called Krishna Dwarika at Gaya.
57. Image called Brahma in the temple of Krishna Dwarika at Gaya. [No. 2 facing p. 79 in Martin's ed.]
58. An image in the temple [of] Krishna Dwarika at Gaya. [No. 1 facing p. 68 in Martin's ed.]
59. Image called Mahamaya in the temple of Krishna Dwarika at Gaya. [No. 2 facing p. 68 in Martin's ed.]
60. Inscription built into the wall of Krishna Dwarika at Gaya.
61. Mandir at Kongch. [On p. 66 of Martin's ed.]
62. An image at Kongch.
63. An image from Kongch said to represent Lakshmi. [No. 1 facing p. 67 in Martin's ed.]
64. An image at Kongch said to represent Kama Deva. [No. 3 facing p. 67 in Martin's ed.]
65. An image at Kongch said to represent Hara and Parvati but it seems very different. [No. 4 facing p. 67 in Martin's ed.]
66. An image at Kongch called Mahadeva. [No. 2 facing p. 67 in Martin's ed.]

67. A Buddha from Kongch with an inscription behind.
68. Plan of Kabar.
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70. Pillar in the temple of Buddha Sen at Keoyadol.
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72. Image carved on the rock at Keoyadol.
73. Group of figures on a rock at Keoyadol.
74. Images carved on the four sides of a stone like an altar at Keoyadol. [No. 1 facing p. 79 in Martin's ed.]
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76. Image carved on the rock at Keoyadol.
77. Plan of the ruins at Buddha Gaya.
78. Image called Gautam Muni on the south side of the Sannyasis' houses at Buddha Gaya.
79. Image on the east wall of the Sannyasis' house at Buddha Gaya.
80. Image on the west door of the Sannyasis' house at Buddha Gaya.
81. Image on the west door of the Sannyasis' convent at Buddha Gaya.
82. Image in the small chamber called Pangchapandu before the great mandir at Buddhagaya. [No. 6 facing p. 74 in Martin's ed.]
83. Image on the south side of the east gate at Buddhagaya.
84. An image on the south side of the Sannyasis' house at Buddhagaya.
85. Image on the east side of the old Mat at Buddhagaya.
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87. Image in the east wall of the Sannyasis' house at Buddhagaya.
88. Image on the east gate of the Sannyasis' [house] at Buddhagaya.
89. Image on the old temple of Buddhagaya.
90. Image on the old temple of Buddhagaya.

91. Image called Sabitri before the great Mandir at Buddhagaya. [No. 3 facing p. 74 in Martin's ed.]
92. Image called Taradevi at Buddhagaya. [No. 5 facing p. 74 in Martin's ed.]
93. Image near the tombs of the Sannyasis at Buddhagaya. [No. 1 facing p. 74 in Martin's ed.]
94. Image on the stair of a well at the Sannyasis' house at Buddhagaya. [No 4 facing p. 74 in Martin's ed.]
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96. Image called Kabir Chandari at Buddhagaya.
97. Image in the Sannyasis' house at Buddhagaya.
98. Image called Vagiswari at Buddhagaya. [No. 2 facing p. 74 in Martin's ed.]
99. An image called Saraswati on the east side of the old Mat at Buddhagaya.
100. An image on the south side of the Sannyasis' house at Buddhagaya. [No. 9 facing p. 72 in Martin's ed.]
101. Image on the south east side of the Sannyasis' house at Buddhagaya. [No. 2 facing p. 72 in Martin's ed.]
102. Image in the Sannyasis' house at Buddhagaya. [No. 6 facing p. 72 in Martin's ed.]
103. Image called Gayatri before the great Mandir at Buddhagaya. [No. 1 facing p. 72 in Martin's ed.]
104. Image on the door of the Sannyasis' [house] at Buddhagaya. [No. 4 facing p. 72 in Martin's ed.]
105. Image called Parwati or Chhotathakurani at Buddhagaya. [No. 3 facing p. 72 in Martin's ed.]
106. Image in the Sannyasis' house at Buddhagaya. [No. 5 facing p. 72 in Martin's ed.]
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109. Inscription carved on the pedestal of an old image by two messengers from Ava at Buddhagaya.
110. Image of a Buddha at Ekanggar Dihi.
111. Pali inscription from the Sannyasis' house at Buddhagaya.
112. Inscription on the threshold of a gate at the same place.
113. Inscription on a stone at the Buddhapad in front of the great Mandir at Buddhagaya.

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115. Old stone called Gariya at Sarawat.
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141. Image of Varaha at Baragang. [No. 1 facing p. 86 in Martin's ed.]

142. Image called Surya at Kasi Tirtha near Brahma-kunda at Rajagriha. [No 2 facing p. 86 in Martin's ed.]
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151. A very large image in a field south a considerable way from the Jain temple at Baragang.
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153. Three headed eight armed goddess in Kopteswari at the S. end of Baragang. [No. 2 facing p. 96 in Martin's ed.]
154. Image in the small temple called Kopteswari at the S. end of Baragang.
155. Image in the small temple called Kopteswari at the south end of Baragang.
156. Goddess standing under two Buddhas in Kopteswari at the S. end of Baragang. [No. 4 facing p. 95 in Martin's ed.]
157. Image at the small temple called Kopteswari at the S. end at Baragang. [No. 6 facing p. 96 in Martin's ed.]
158. Inscription at the temple of Surya in Baragang on a image exactly resembling the large one found in a field south from the Jain temple.
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160. One of the three Buddhas near the northernmost of the three conical mounds at Baragang. [No. 1 facing p. 95 in Martin's ed.]
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- the hands added from another exactly similar, but smaller.
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 182. Door of the shrine in the temple of Surya at Dapthu. [At foot of p. 98 in Martin's ed.]
 183. Image of Nrisingha at Dapthu. [No. 6 facing p. 99 in Martin's ed.]
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 187. Inscription on the door of the cave called Mirza Mundai.

188. Inscription above the Haji Hurmayen Mandau.
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199. Image of Siddheswari on the Suryangka hill.
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207. Another part of the same inscription. Note on the Illustrations.

The two illustrations in the frontispiece of Vol. I of Montgomery Martin's *Eastern India* are reproductions of illustrations in the Buchanan collection, in the volume entitled "Buchanan Hamilton Drawings, Vol. I, Costumes of Behar."

The plan facing p. 35 in the same volume is a contracted reproduction of No. 1 in "Buchanan Hamilton Drawings, Vol. 3, Maps and Plans."

The map facing page 3 is a reduced copy of Buchanan's map (Now in the Map Department of the India Office), with only a portion of the names indicated. There are two copies of this map.

The illustrations in the foregoing list are to be found in the unnumbered volume of Buchanan Hamilton Drawings, with the exception of No. 5 which is 5a in Vol. II.

The inscriptions in the list are to be found in "Buchanan Hamilton Drawings, Vol. IV, Inscriptions."

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